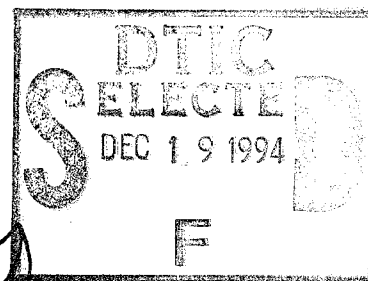


**U.S. Army  
Defense Ammunition Center and School  
(USADACS)**

**Validation Engineering Division  
Capabilities**



This document has been approved  
for public release and sale; its  
distribution is unlimited.

Savanna, IL

19941214 036

# U.S. Army Defense Ammunition Center and School (USADACS)

## Test Facilities

This guide was prepared to provide readers  
with a general description of USADACS test  
capabilities and facilities.

August 1992

Accession For	
NTIS CR/ISI	<input checked="checked" type="checkbox"/>
DTIC TAB	<input type="checkbox"/>
Unannounced	<input type="checkbox"/>
Justification	
by	
Distribution	
/	
Special	
A-1	

JOHN L. BYRD, JR.  
Director  
Defense Ammunition Center and School

## TABLE OF CONTENTS

<i>Introduction.</i> .....	3
<i>Mission and Support Personnel</i> .....	6
<i>Area Map</i> .....	7
<i>Outdoor Test Facilities</i> .....	8
1. Aerial and Plan View of Outdoor Test Facilities .....	9
2. Truck and Rail Loading Capabilities.....	10
3. Rail Impact Test Course. ....	11
4. Road Hazard Course. ....	12
5. Washboard Course.....	13
6. 30-Mile Road Hazard Course. ....	14
7. Shipboard Transportation Simulator (STS) and Static Pull Test., .....	15
8. Vehicle Test Equipment. ....	16
9. Explosive Test Facility .....	17
10. Outdoor Environmental Tests. ....	18
11. Prepositioned Ships Afloat (PREPO) and Outdoor Temperature/Humidity Monitoring. ....	19
12. Passive Ammunition Storage System (PASS) and Airflex Shelter Temperature/Humidity Monitoring.....	20
13. Outdoor Portable Pre-Conditioning Chamber.....	21
14. DynaTension Cable Tension Measuring Instrument and Chatillon Dynamometers. ....	22
15. High-Speed Data Acquisition System and Computer Equipment.....	23
16. SnapShock Peak Acceleration and Environmental Data Loggers.....	24
<i>Indoor Test Facilities</i> .....	25
1. Transportability Test Facility .....	26
2. Salt-Fog Chamber and Environmental Pre-Conditioning Chamber. ....	27
3. Low-Frequency Vibration Tables. ....	28
4. High-Frequency Vibration Table and Ormond 50,000-Pound Tension/Compression Table. ....	29
5. Incline-Plane Impact. ....	30
6. Instron 10,000-Pound Tension/Compression Unit with Environmental Chamber and Instron 20,000-Pound Tension/Compression Unit. ....	31

7. 50,000-Pound Weld Tension/Compression Pull Tester and Avco Shock Machine. ....	32
8. Atlas Weatherometer and 2.5 Kilowatt Microwave Radiation Furnace. ....	33
9. Mass Spectrometer/Associated Equipment and Gallmac Gas Leak Detector. ....	34
10. Hydrostatic Test Equipment and Precision Sound-Level Meter and Analyzer. ....	35
11. Portable Data Recorders for Long-Term Storage Tests. ....	36
12. Sensotec Pressure Transducers and Panametrics Ultrasonic Thickness Gage. ....	37
13. Computer Interfaced Profilometer and Testing Inspection Table. ....	38
14. Delmhors Moisture Detector and Datametrics Air Velocity Meter. ....	39
<i>Appendixes</i> .....	40
1. USADACS Points of Contact (POCs). ....	41
2. USADACS Visitors Guide. ....	42
3. Material Handling Equipment (MHE) and Specifications. ....	45
4. Typical Items Tested in the Past. ....	49



## INTRODUCTION

The U.S. Army Defense Ammunition Center and School (USADACS) ammunition logistics validation facilities are located in northwestern Illinois along the Mississippi River. U.S. Army Defense Ammunition Center and School, a tenant on the Savanna Army Depot Activity (SVADA), uses approximately 75 technical, administrative, and operational buildings within this 13,000-acre installation. Its major missions are civilian ammunition training through its Ammunition School, explosives safety support to the Department of the Army (DA) through its Technical Center for Explosives Safety (TCES), assistance to all DA installations in areas of supply, maintenance, transportation through its Logistics Review and Assistance Office, management of two career programs for Quality Assurance Specialists (Ammunition Surveillance) (QASAS) and ammunition managers, as well as its logistics engineering support through its Logistics Engineering Office.

### LOGISTICS ENGINEERING OFFICE ORGANIZATION

The Logistics Engineering Office is comprised of the following four divisions:

Maintenance Engineering Division (SMCAC-DEM). Designs, fabricates, prototypes, and verifies safety approval of Ammunition Peculiar Equipment (APE) used in maintenance, surveillance, renovation, and demilitarization operations.

Supply Engineering Division (SMCAC-DES). Designs standard unitization/palletization and storage procedures for DA; fabricates, prototypes ammunition support equipment (ASE); e.g., slings, beams, pallet jacks, etc.; as well as overall modernization of depot supply operations.

Transportation Engineering Division (SMCAC-DET). Designs methods and procedures for the outloading (load, blocking, and bracing) prior to transportation of ammunition by rail, road, and ship in commercial as well as tactical environment.

Validation Engineering Division (SMCAC-DEV). Provides validation/verification of engineering designs and/or procedures developed by the other three divisions, as well as verification of designs outside of USADACS, such as U.S. Army Missile Command (MICOM), U.S. Army Tank-Automotive Command (TACOM), etc. The Validation Engineering Division routinely conducts MIL-STD-1660 verification of unitization/palletization procedures; MIL-STD-810E verification of rail, road, and ship transportability; and MIL-STD-398 APE explosive safety verification. This division also provides extensive instrumentation support to the U.S. Army (USA). A typical example of its unique instrumentation capability included the temperature, humidity, and solar radiation monitoring of ammunition stored in Saudi Arabia (SA) during Operation Desert Shield/Storm in order to assist U.S. Army Armament Research, Development and Engineering Center (ARDEC), Predictive Technology Branch, with serviceability projections.

Unique to the USA is USADACS inhouse capability to accomplish DA priority logistics engineering challenges. An excellent example was "Operation Steel Box" wherein USADACS

manufacturing engineering support at Mainz Army Depot (MZAD) in the Federal Republic of Germany (FRG), internal restraint of the toxic chemical munitions within the SSC, restraint of the SSCs within Military Vans (MILVANS), as well as, all CONUS and host nation validation requirements (transportability and leak testing) which resulted in the successful retrograde operation.

**LOGISTICS ENGINEERING OFFICE**

SMCAC-DE  
BILL ERNST  
DSN 585-8922

**SUPPLY  
ENGINEERING  
DIVISION**

SMCAC-DES  
TOM MICHELS  
DSN 585-8928

**DESIGN/PROCEDURES  
STANDARDS**

- UNIT LOADS
- STORAGE
- HANDLING (ASE)
- STEEL PALLETS
- MODERNIZATION

**MAINTENANCE  
ENGINEERING  
DIVISION**

SMCAC-DEM  
DICK GREEN  
DSN 585-8926

**STANDARD AMMUNITION  
PECULIAR EQUIPMENT:**

- MAINTENANCE
- SURVEILLANCE
- RENOVATION
- DEMILITARIZATION

**TRANSPORTATION  
ENGINEERING  
DIVISION**

SMCAC-DET  
BILL FRERICHs  
DSN 585-8927

**STANDARD OUTLOADING  
PROCEDURES:**

- WHOLESALE/RETAIL
- SURFACE/AIR
- JOINT SERVICE

**VALIDATION  
ENGINEERING  
DIVISION**

SMCAC-DEV  
JERRY KROHN  
DSN 585-8929

**VALIDATION TESTING:**

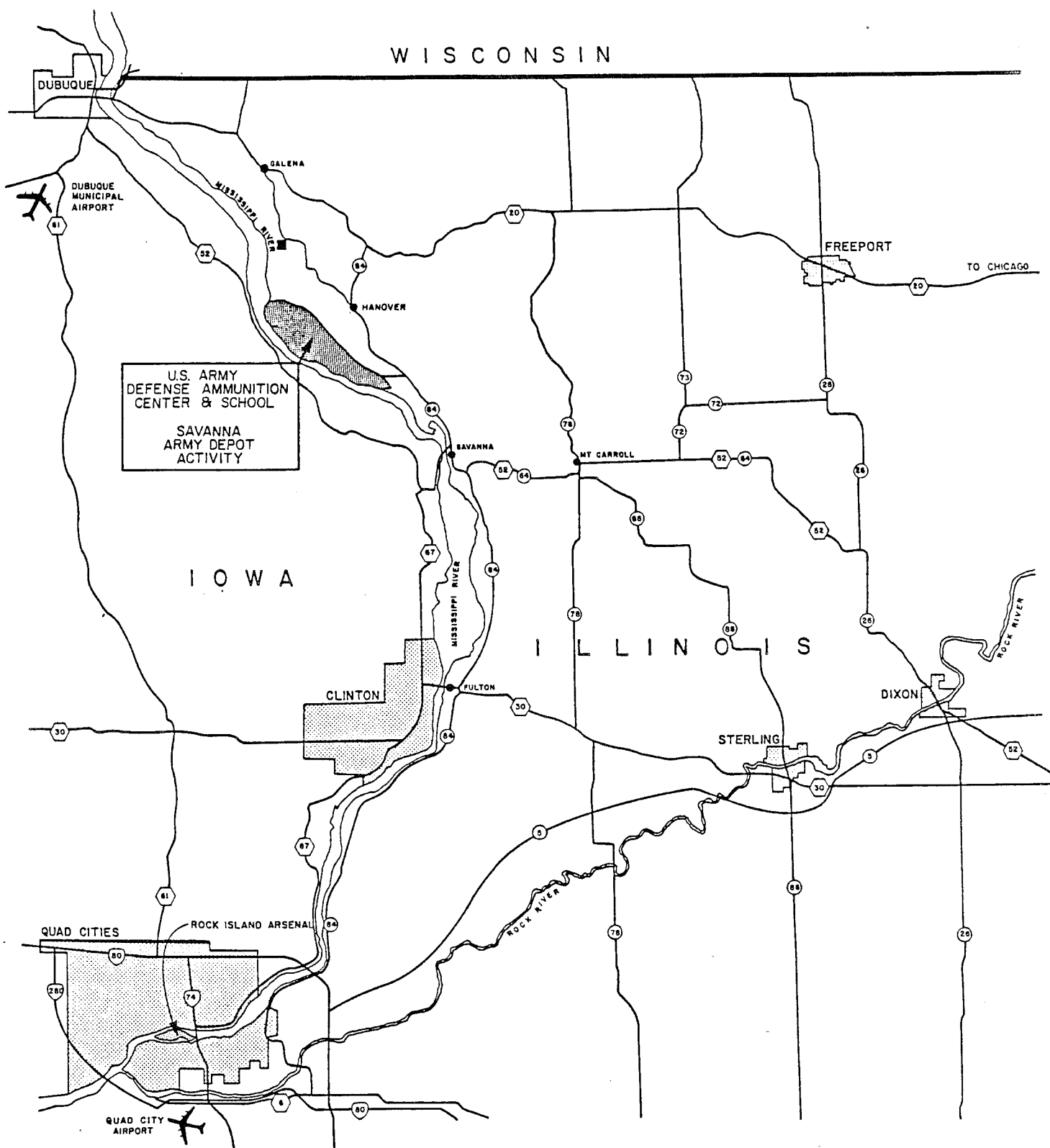
- MIL STD 1660
- MIL STD 810E
- MIL STD 398
- INSTRUMENTATION

## MISSION AND SUPPORT PERSONNEL

### VALIDATION ENGINEERING DIVISION

**Mission:** Perform validation/certification tests to determine that transportation vehicles, blocking and bracing procedures, unitized loads, and Ammunition Peculiar Equipment (APE) meet design and Required Operational Capability (ROC) requirements.

<b>Support:</b>	<b><i>Personnel:</i></b>	<b><i>Title:</i></b>	<b><i>DSN/Comm:</i></b>
	Krohn, Jerome	- Chief	585-8908/815-273-8908
	Thulion, Martha	- Program Assistant	585-8929/815-273-8929
	Meyer, William	- Test Engineer	585-8090/815-273-8090
	Hartman, Quinn	- Test Engineer	585-8992/815-273-8992
	Solberg, Jason	- Test Engineer	585-8079/815-273-8079
	McIntosh, Alfred	- Test Engineer	585-8989/815-273-8989
	Erquitt, Emory	- Equipment Specialist	585-8907/815-273-8907
	Valant, David	- Electronics Technican	585-8988/815-273-8988
	Simmons, Thomas	- Engineering Draftsman	585-8094/815-273-8094
	Von Thun, Steven	- Engineering Draftsman	585-8093/815-273-8093
	Stewart, Sally	- Illustrator	585-8014/815-273-8014



USADACS TO: O'HARE INTERNATIONAL AIRPORT ..... 150 MILES  
(CHICAGO, ILLINOIS)

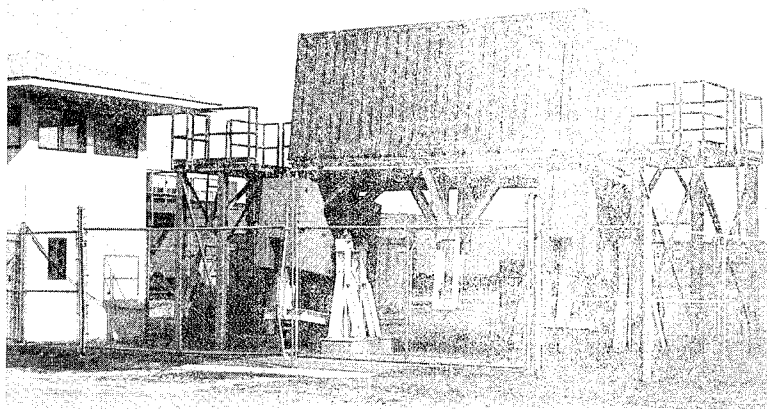
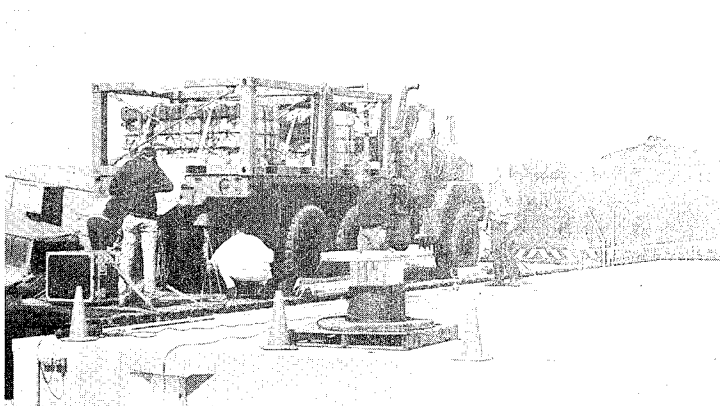
USADACS TO: QUAD CITY AIRPORT ..... 70 MILES  
(ROCK ISLAND, ILLINOIS)

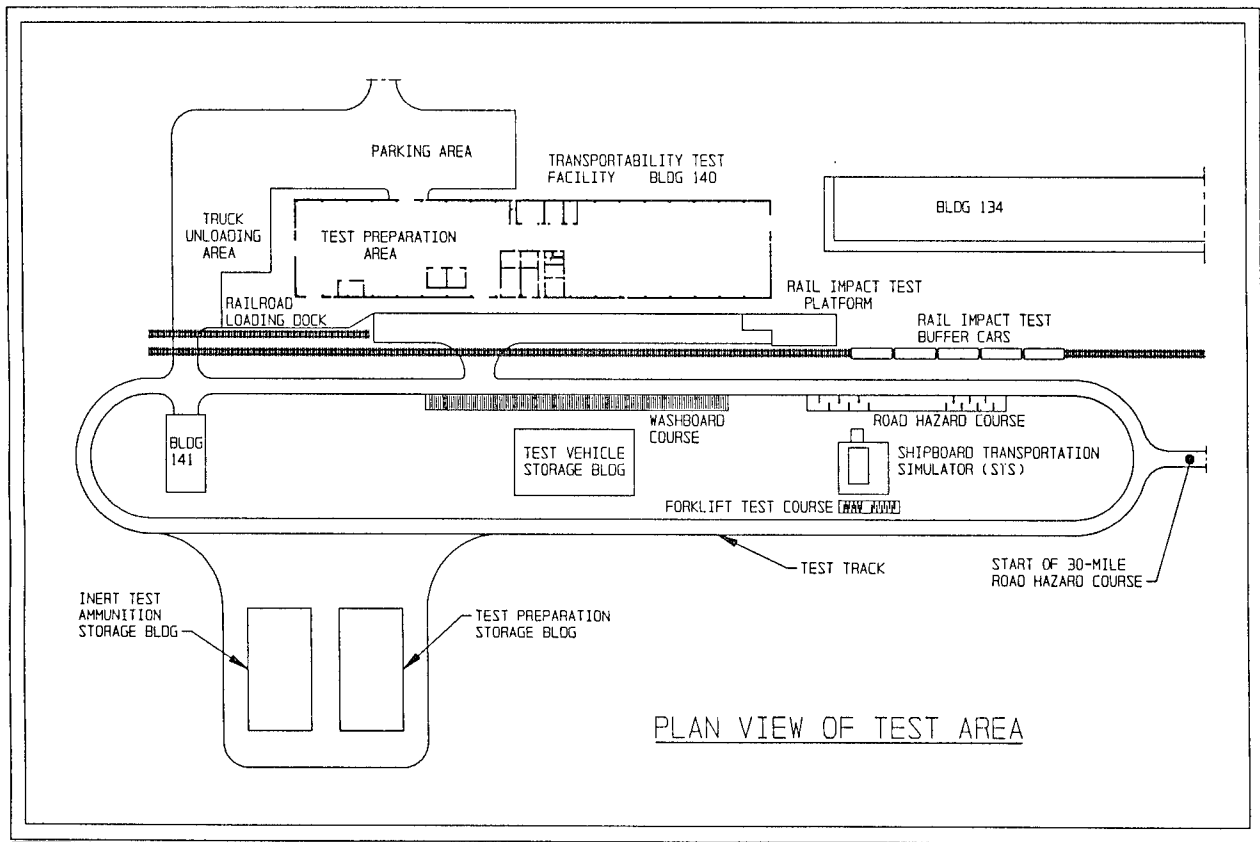
USADACS TO: DUBUQUE MUNICIPAL AIRPORT ..... 45 MILES  
(DUBUQUE, IOWA)

# USADACS

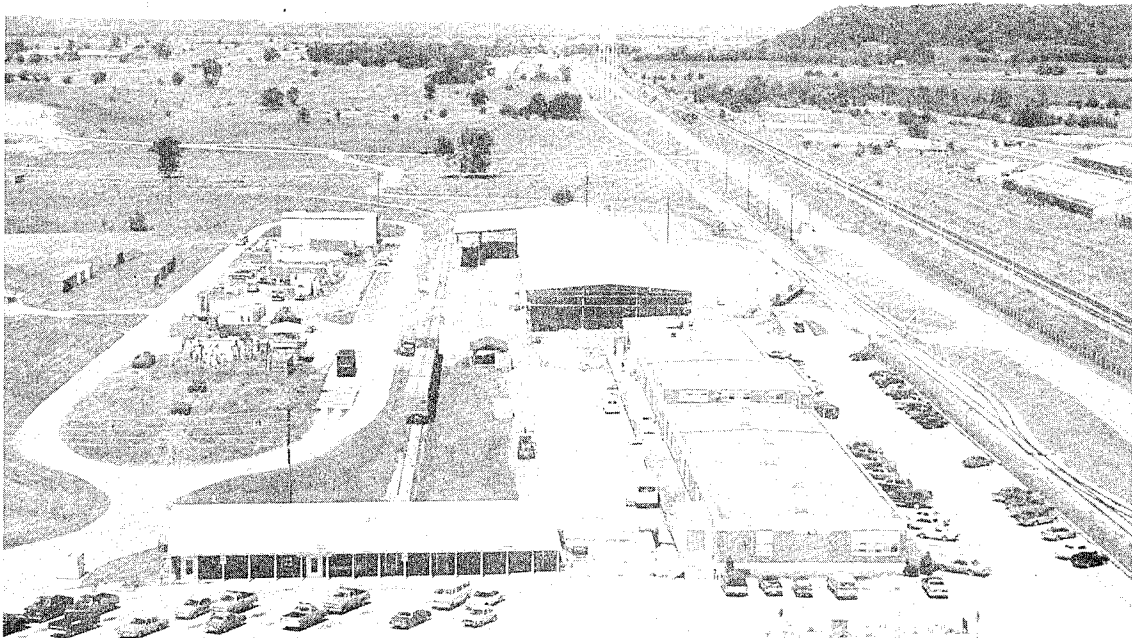
## Validation Engineering Division

### Outdoor Test Facilities

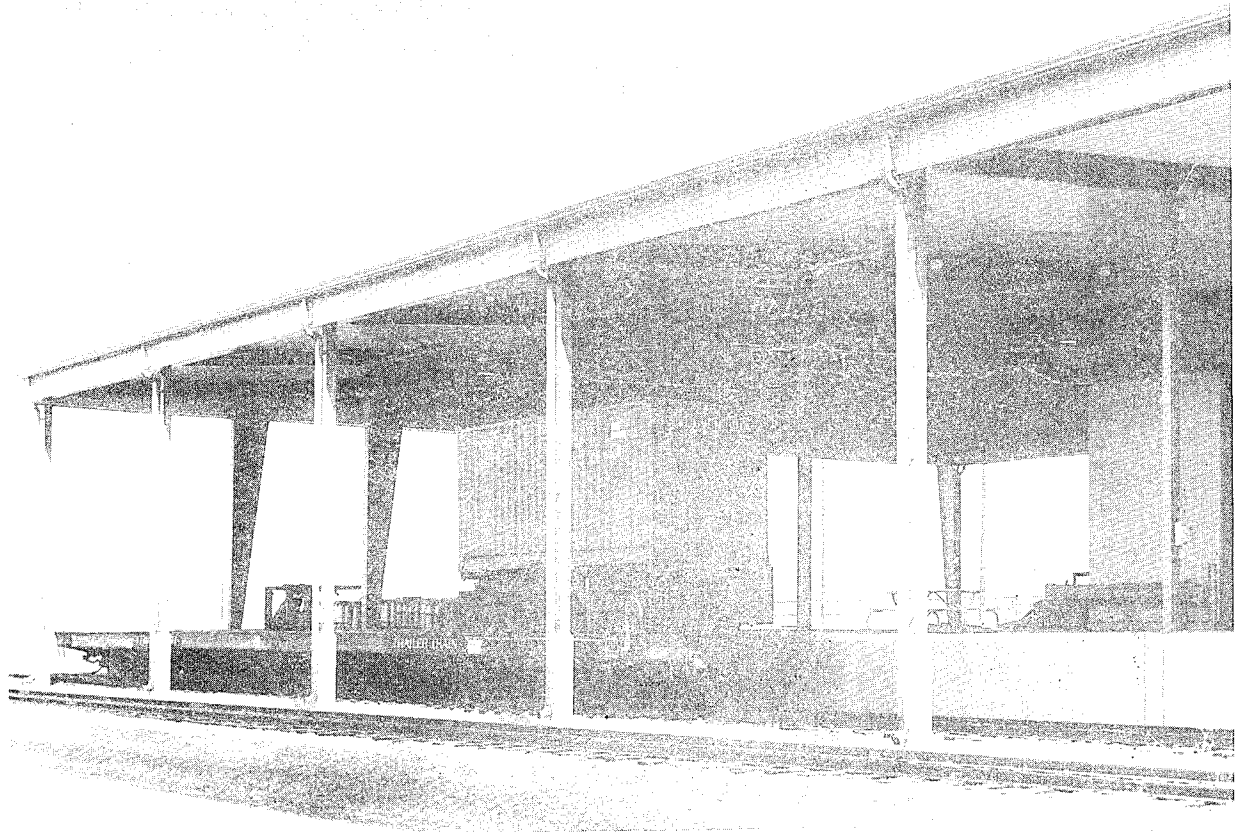




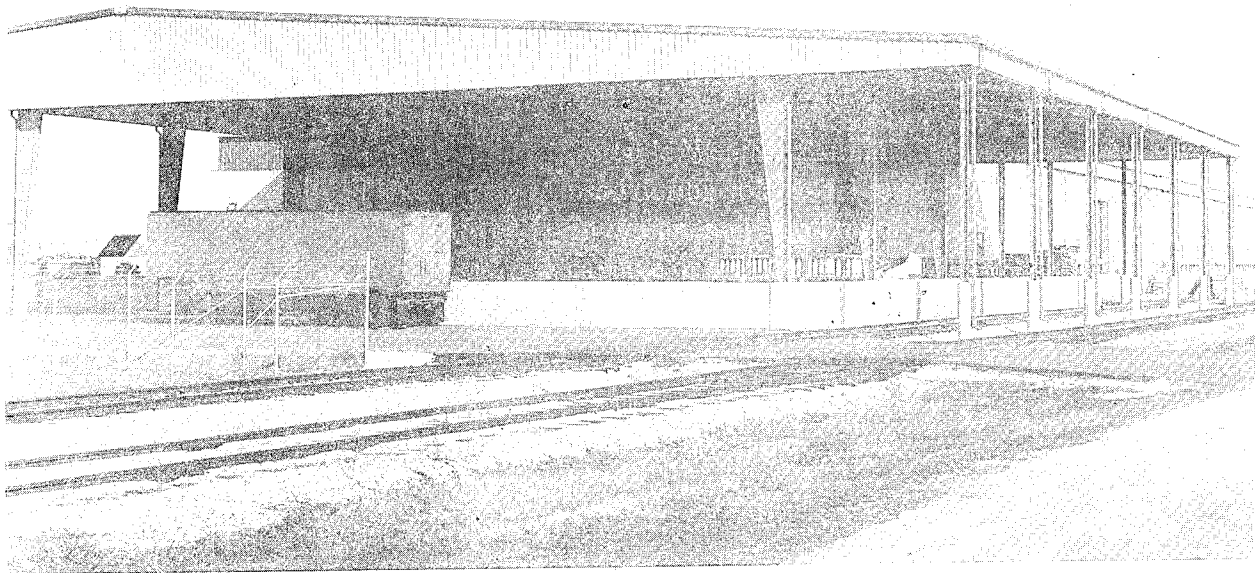
Overall drawing of the majority of USADACS outdoor test facilities.



The outdoor test facilities cover approximately 35 acres consisting of the following: Rail Impact Test Course, Road Hazard Course, Washboard Course, Shipboard Transportation Simulator (STS), Forklift Test Course, 30-mile Road Hazard Course, Testing Storage, and open areas used for long-term testing.

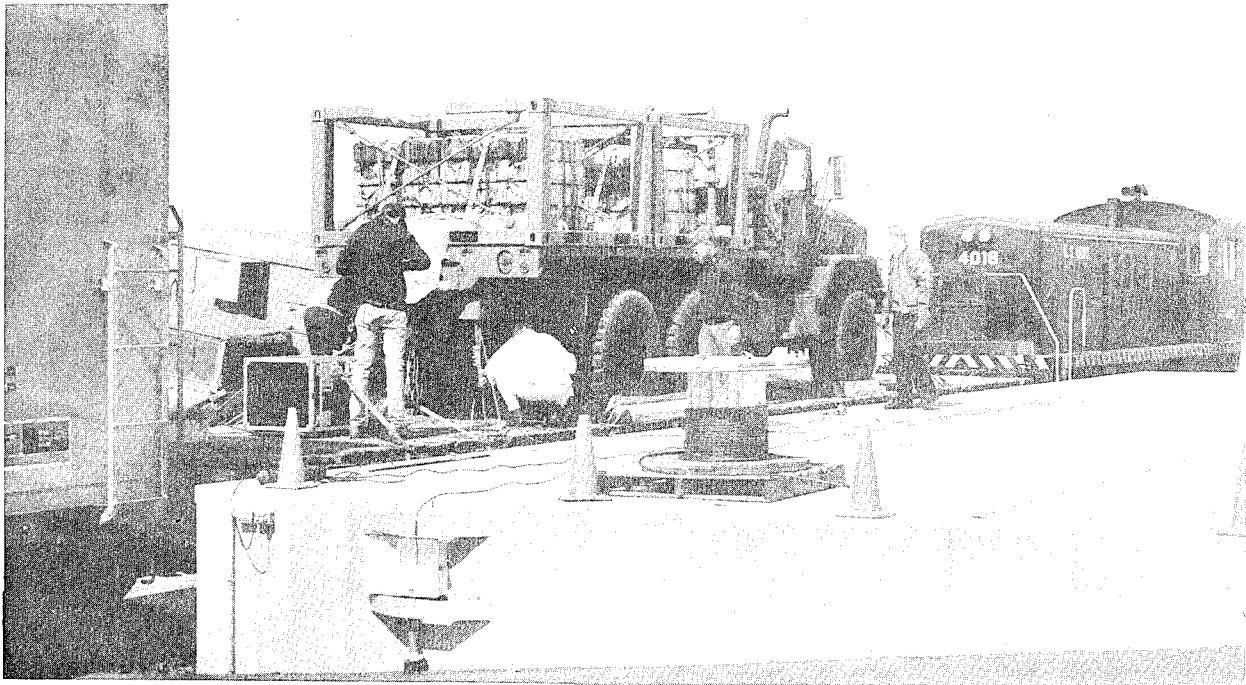


**Railcar Side-Loading Capabilities.** This is the test preparation area for rail impact and road transportability tests. One railcar can be loaded under the shelter during inclement weather.



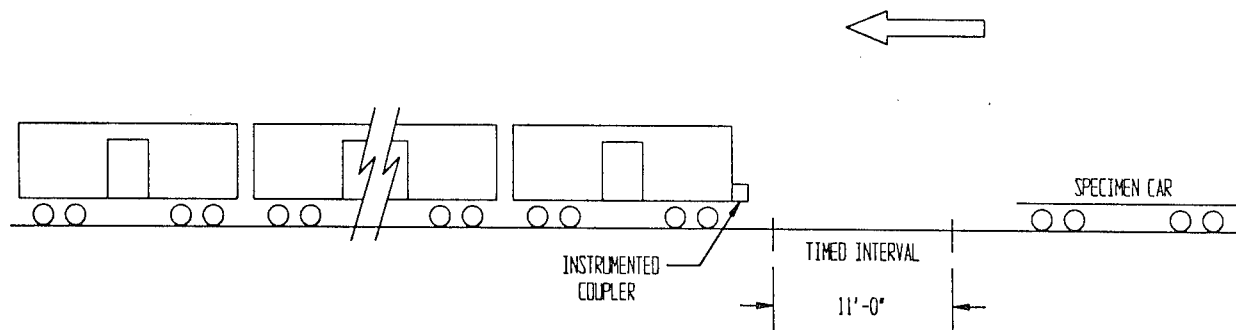
**Transportation Testing Facility's dock loading capabilities.** In addition to the railcar loading dock, there are also two truck loading docks and a total of 14,000 square feet of docking area.





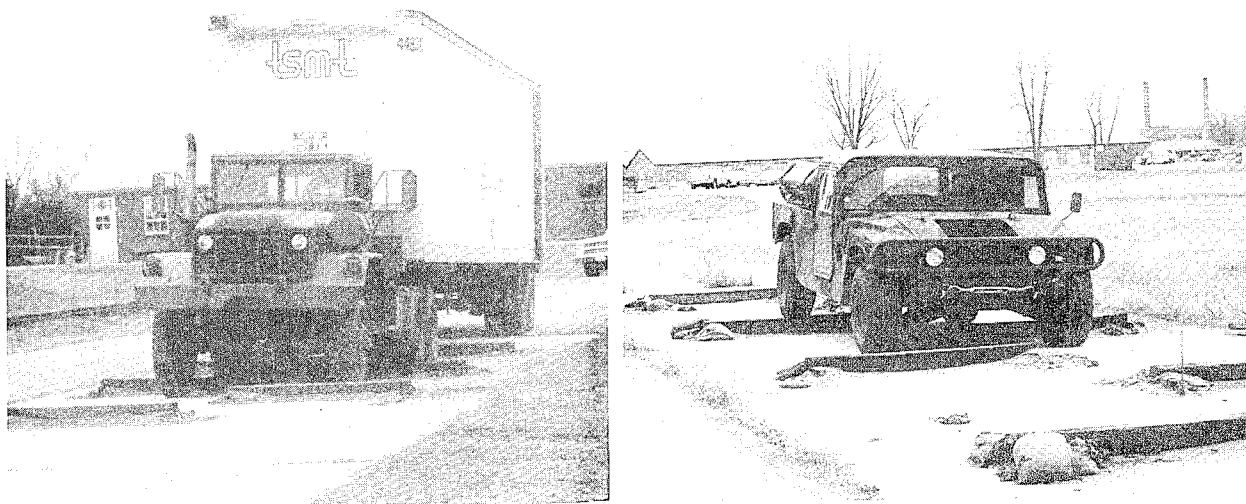
The rail impact test is conducted with five buffer cars representing an anvil with the cars draft gears compressed and air brakes in a set position. The total anvil weight is approximately 250,000 pounds. The specimen car is released by switch engine at speeds of 4, 6, and 8.1 mph. Then the car is reversed and released at 8.1 mph. The timed interval of velocity is between 0 and 11 feet before impact.

#### ASSOCIATION OF AMERICAN RAILROADS (AAR) STANDARD TEST PLAN

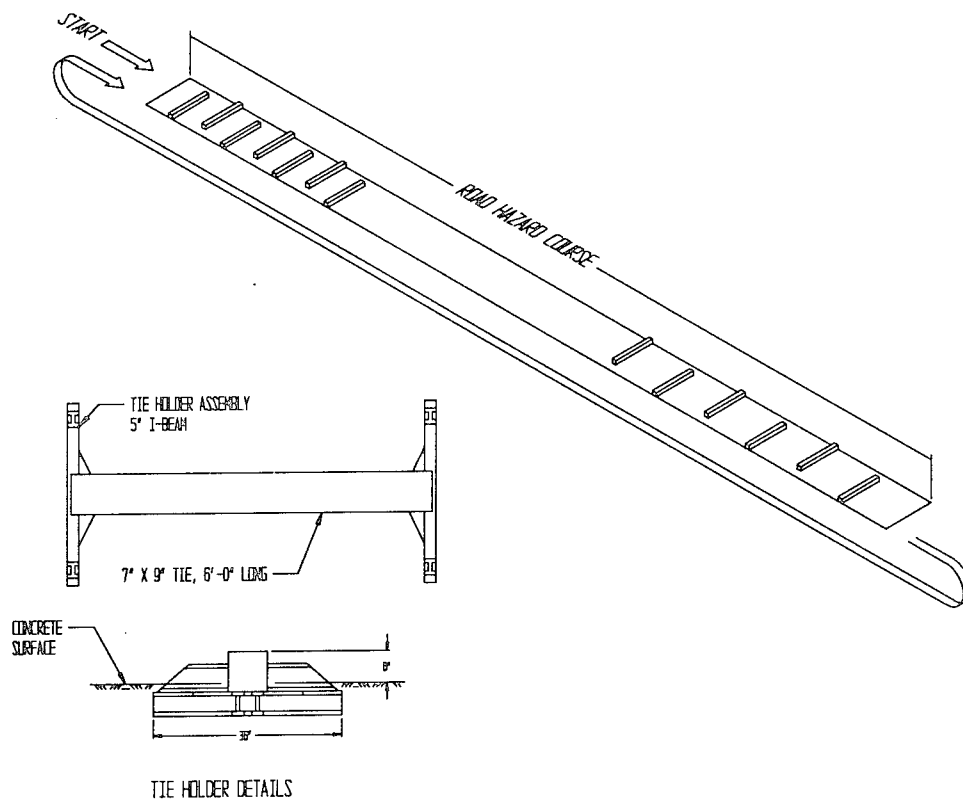


5 BUFFER CARS (ANVIL) WITH DRAFT GEAR  
COMPRESSED AND AIR BRAKES IN A SET  
POSITION  
ANVIL CARS TOTAL WT 250,000 LBS (APPROX)

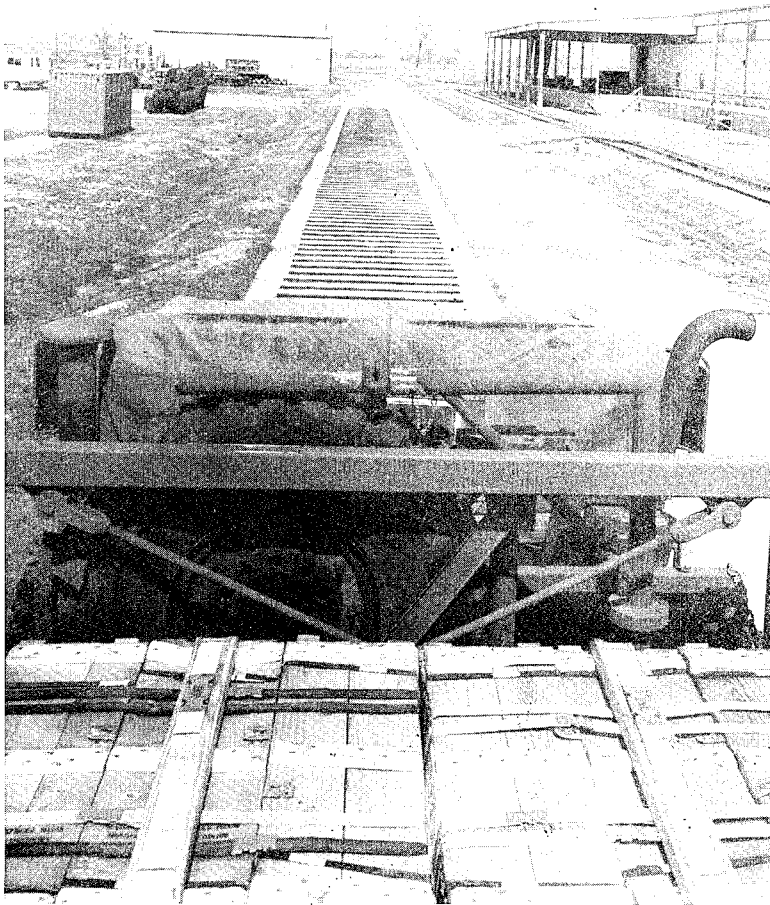
SPECIMEN CAR  
IS RELEASED BY  
SWITCH ENGINE TO  
ATTAIN: IMPACT NO. 1 @ 4 MPH  
IMPACT NO. 2 @ 6 MPH  
IMPACT NO. 3 @ 8.1 MPH  
THEN THE CAR IS REVERSED AND  
RELEASED BY SWITCH ENGINE TO  
ATTAIN: IMPACT NO 4. @ 8.1 MPH



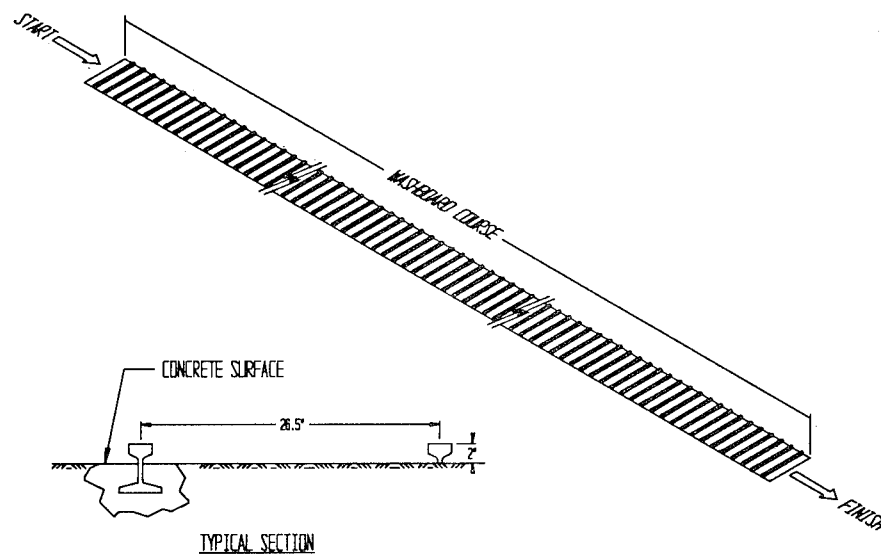
The Hazard Course provides a 200-foot-long segment of concrete-paved road with two series of railroad ties projecting 6 inches above the level of the road surface. The purpose of the Road Hazard Course is to subject a specimen load to violent vertical and side-to-side rolling action. Some sample tests have included Multiple Launch Rocket System (MLRS) container handling with variable-reach forklift and transportation of Military Vans (MILVANS) on semitractor trailers.



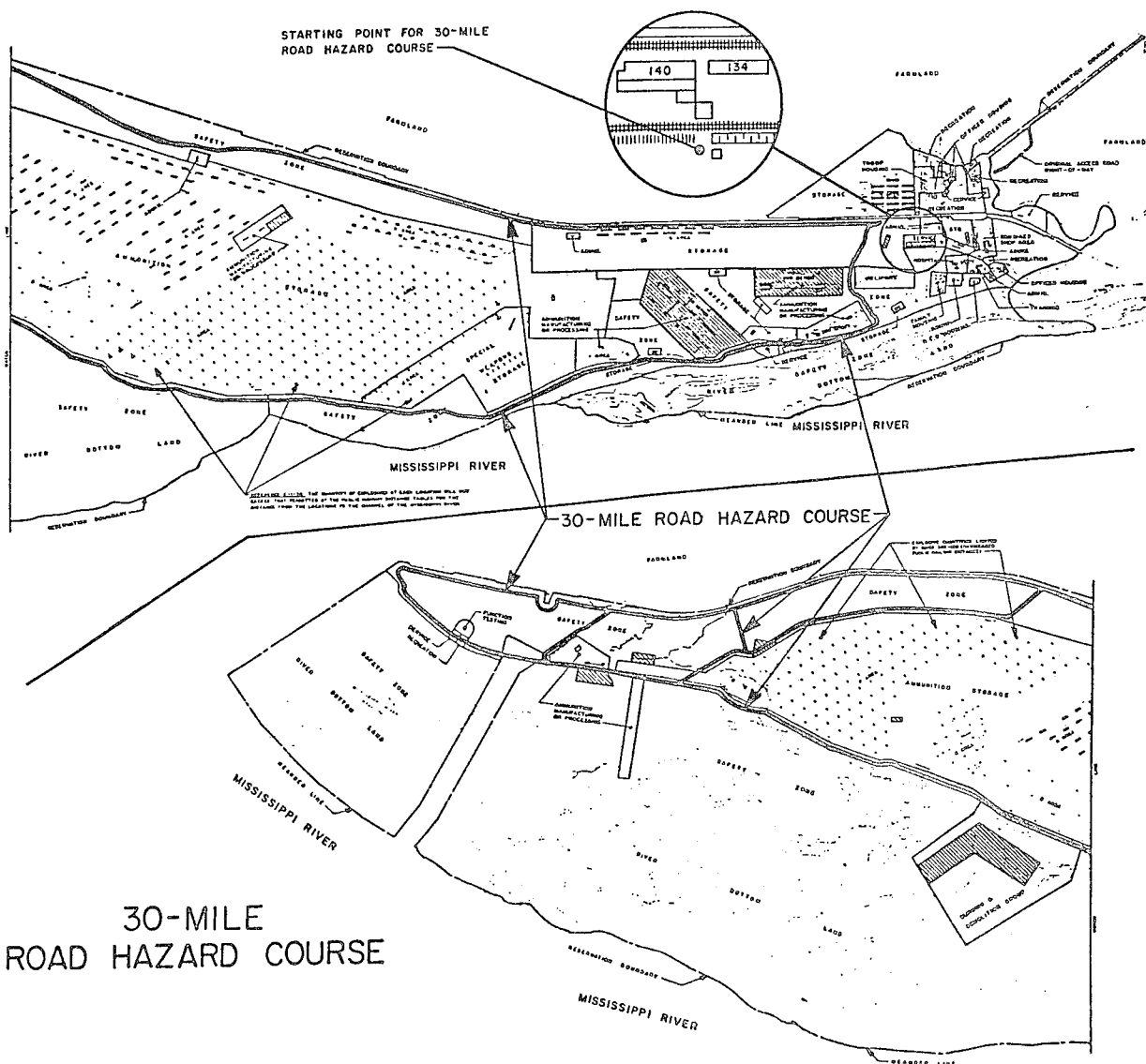
Road Hazard Course Specifications



The Washboard Course is 300 feet long. It is used to test transportability of specimen loads at speeds that produce a resonant frequency of the vehicle's suspension system beneath the load.

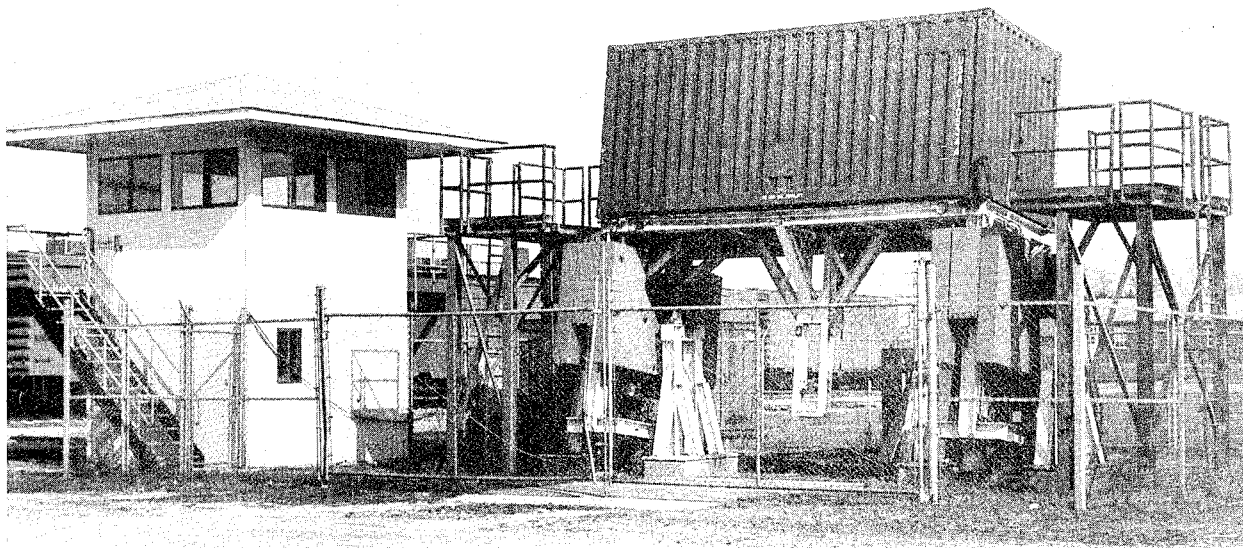


Washboard Course Specifications

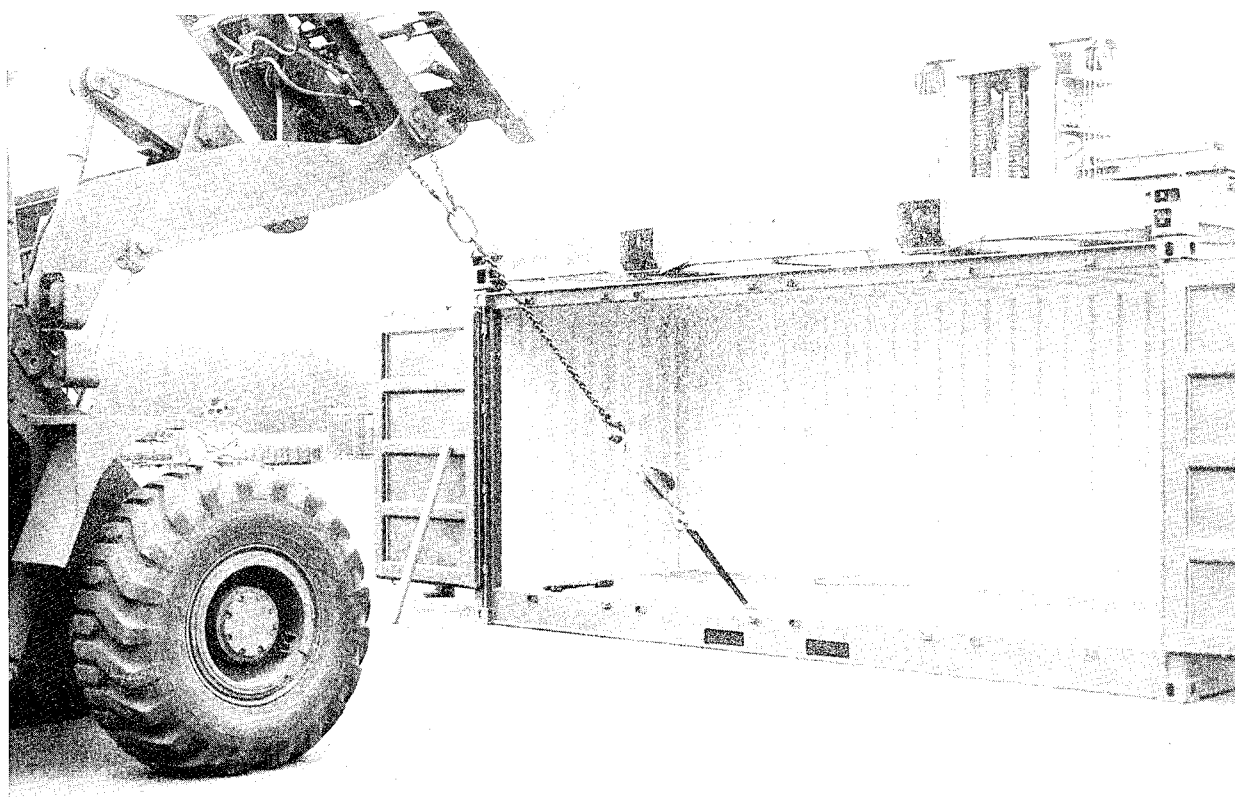


## 30-MILE ROAD HAZARD COURSE

The 30-Mile Road Hazard Course involves a combination of roads surfaced with gravel, concrete, and asphalt. The test route includes curves, corners, railroad crossings, cattle guards, stops and starts. The test vehicle travels at maximum speeds suitable for the particular road being traversed. This test allows the tactical vehicle/specimen load to be subjected to three full airbrake stops while traveling in the forward direction and one in the reverse direction while traveling down a 7 degree grade. The first three stops are at 5, 10, and 15 mph, while the stop in the reverse direction is of approximately 5 mph.



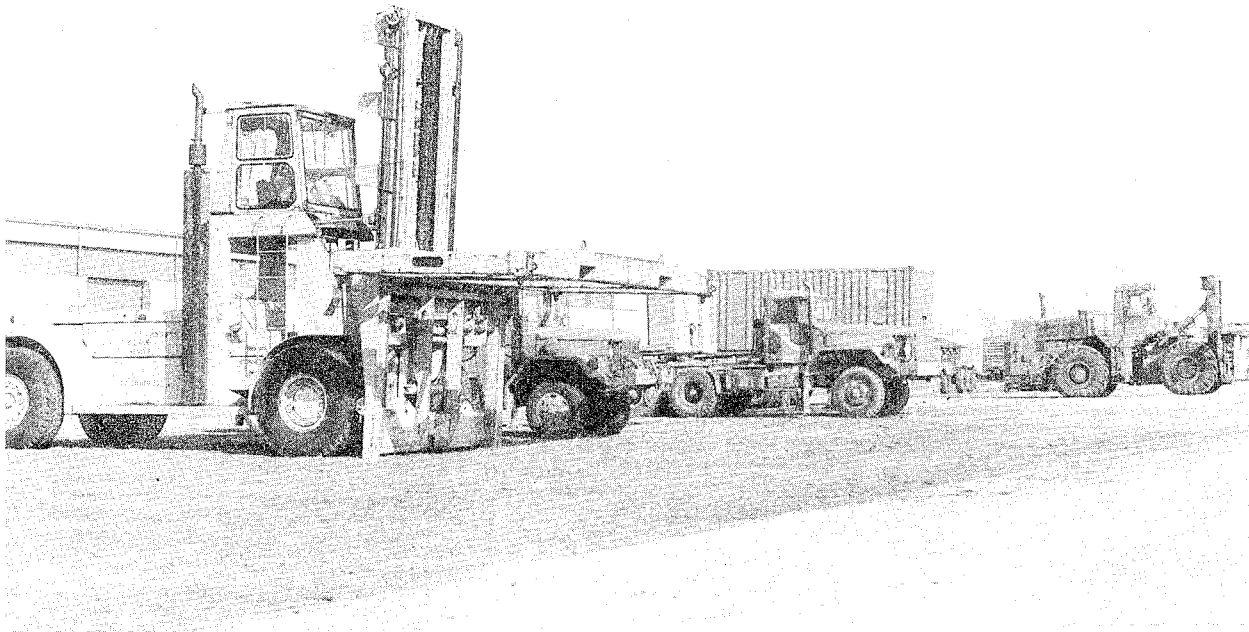
Shipboard Transportation Simulator (STS). This equipment is used to test 20-foot MILVANS and commercial containers. It has a capacity of 40,000 pounds. The STS will simulate shipboard rolls up to 30 degrees on both sides of vertical.

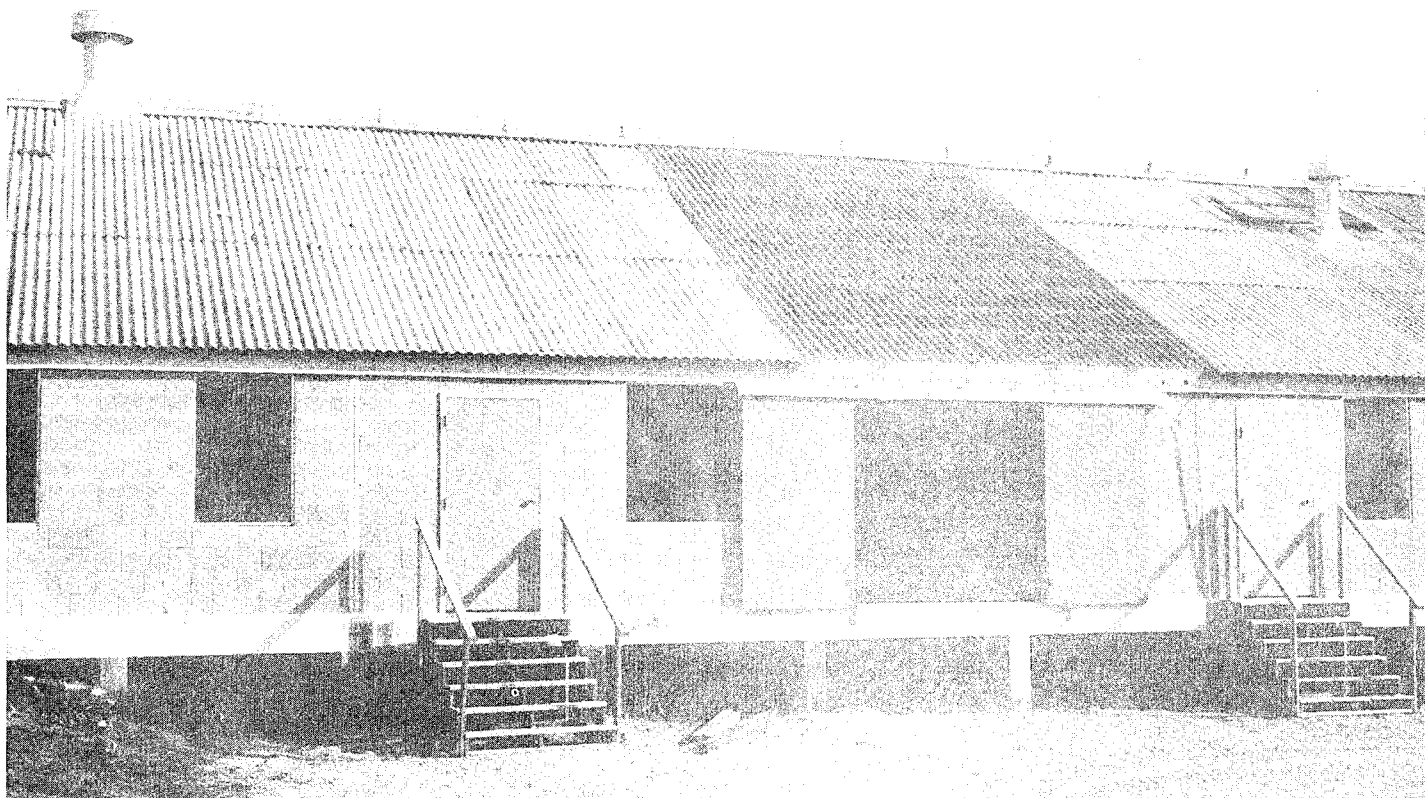


The static pull test is performed with the necessary equipment, including the dynamometer, to measure the required static pull necessary to test the provision at the specified angle. Web straps, metal banding, cargo tiedown provisions, vehicle tiedown provisions, and slinging attachments are pulled to a predetermined tensile force to validate the specimen tested.

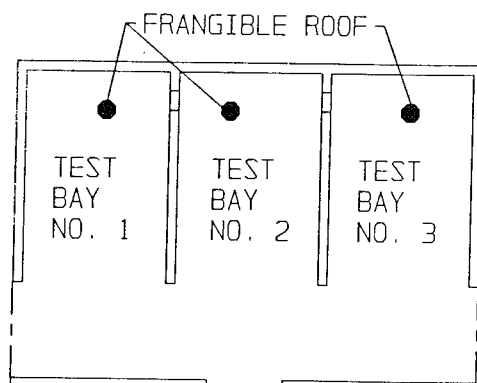


USADACS has numerous material handling equipment (MHE), as well as test vehicles, to conduct road, rail, and shipboard ammunition test simulations. For example, there is the 50,000-pound capacity MILVAN container handler, which is used for stacking and test loading of containers. Another example is the 10,000-pound capacity rough terrain forklift (see appendix for details).



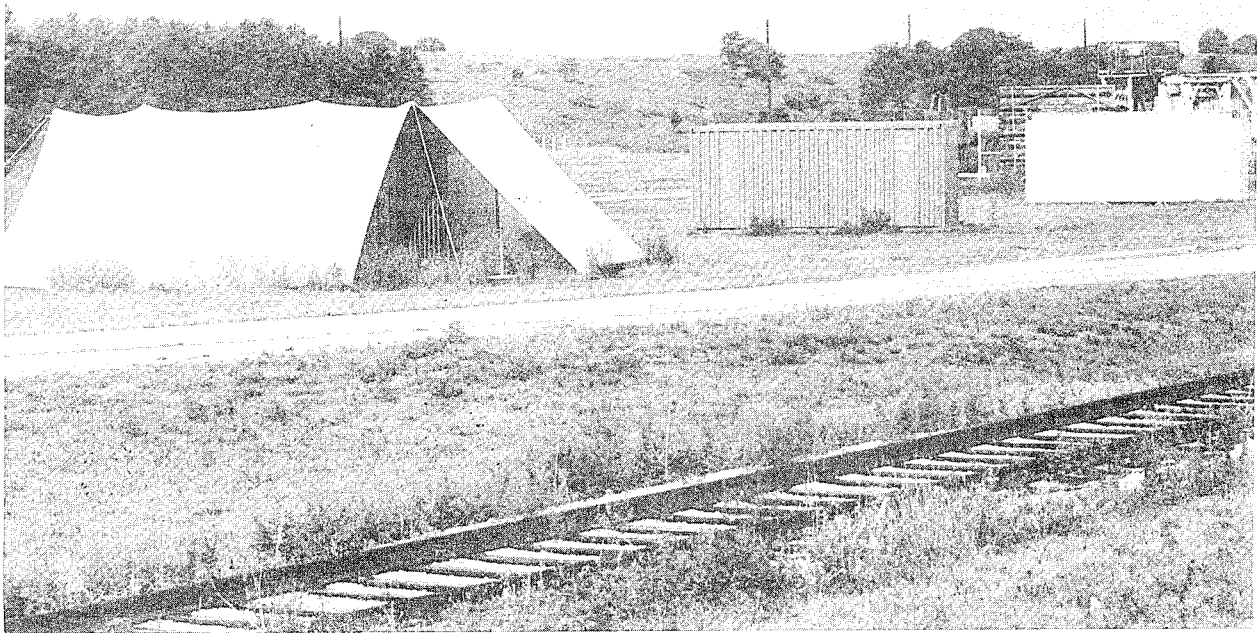


The USADACS Explosive Test Facility is used for testing operational shields designed to protect operating personnel from explosive side on blast overpressure, thermal flux radiation, and schrapnel produced by functioning a controlled amount of explosives in a simulated operational environment. The simulated operational environment is representative of a typical ammunition renovation line utilizing operational bays. This building has three operational bays that meet the physical requirements of MIL-STD-398, Military Standard Shields, Operational for Ammunition Operations, Criteria for Design of and Tests for Acceptance. The explosive limits of the facility are 50 pounds of propellant and 5 pounds of high-explosive material. This facility consists of three test bays with frangible roofing and 12-inch thick, steel-reinforced concrete walls. The test bays have instrumentation to measure blast overpressure, thermal flux, and noise level. It also contains high-speed

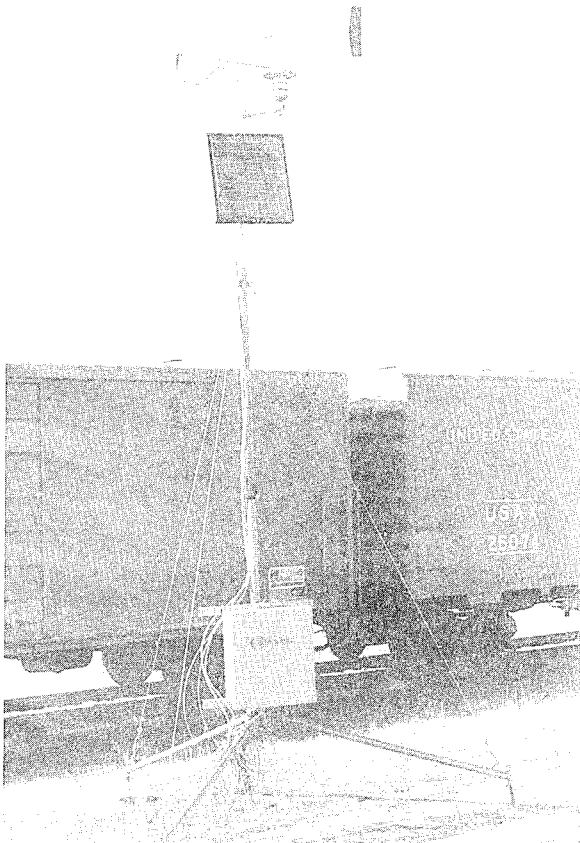


videotape and high-speed motion picture cameras (10,000 fps). USADACS maintains the equipment to perform MIL-STD-398, Military Standard Shields, Operational for Ammunition Operations, Criteria for Design of and Tests for Acceptance, tests on site.



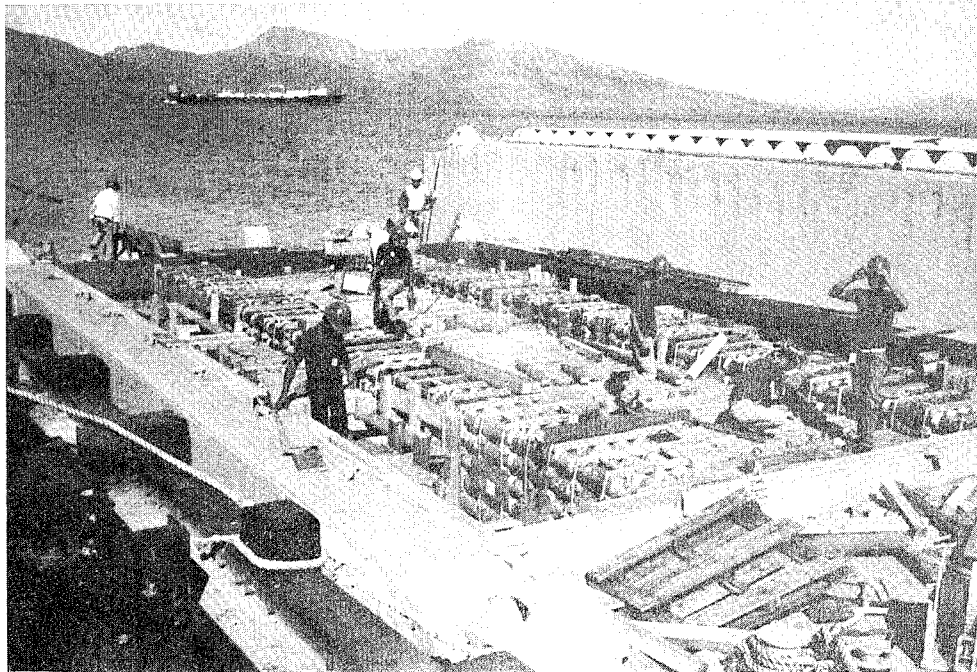


USADACS solar radiation test capabilities. For example, this photo shows one MILVAN protected by a Natick Research, Development and Engineering Center (NRDEC) tarp, another that is unprotected, and yet another that is covered with a Colbrand blanket.



Portable Weather Station. This weather station is used during solar radiation tests to record environmental data on the testing site. It is capable of long-term data recordings without service.





Prepositioned Ammunition Ships Afloat (PREPO). Break bulk PREPO ships have developed corrosion problems due to the salt, high temperature and high humidity environment. Conditions of temperature and humidity within the ship compartments have been recorded over extended periods of time with data loggers installed by the Validation Engineering Division.



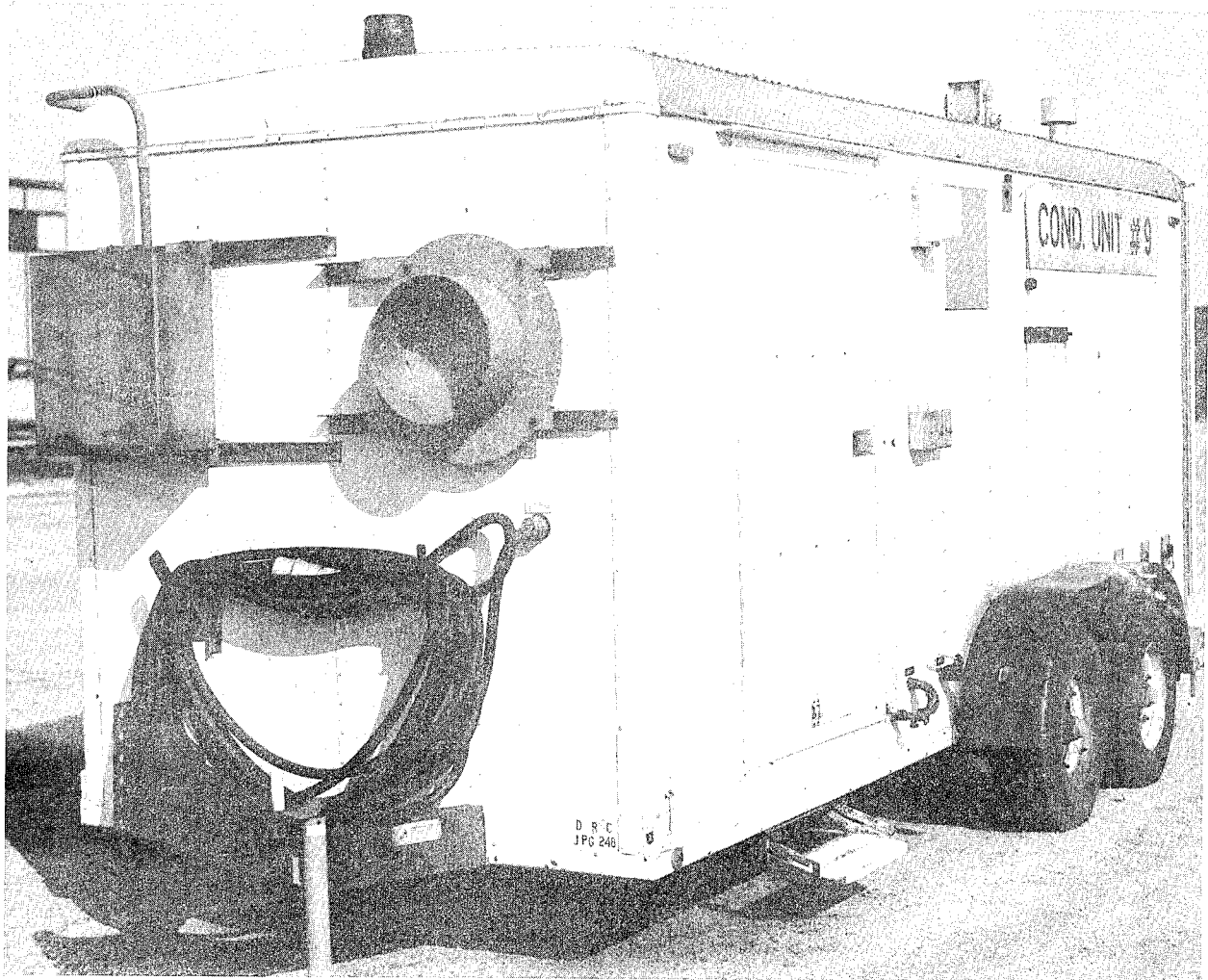
Passive outdoor temperature monitoring of ammunition in Saudi Arabia.



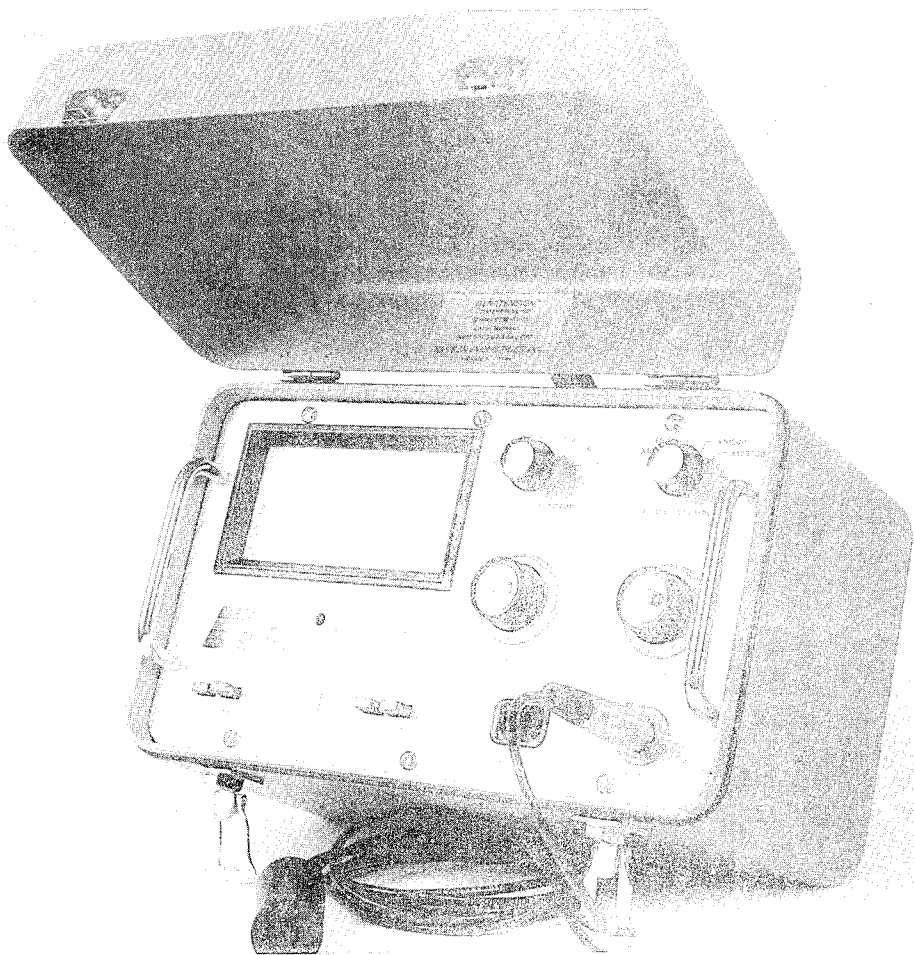
Passive Ammunition Storage System (PASS). Concern about weather induced deterioration of open stored contingency ammunition stocks has resulted in the tasking to monitor temperature/humidity of the conventional ammunition over the long term. Various types of ammunition in various states of open storage are instrumented to obtain actual moisture and temperature to which the rounds are exposed.



The vacuum-sealed airflex shelter is being evaluated to compare the temperature and humidity within the shelter to ambient conditions at the test site in Chibana, Okinawa, Japan.

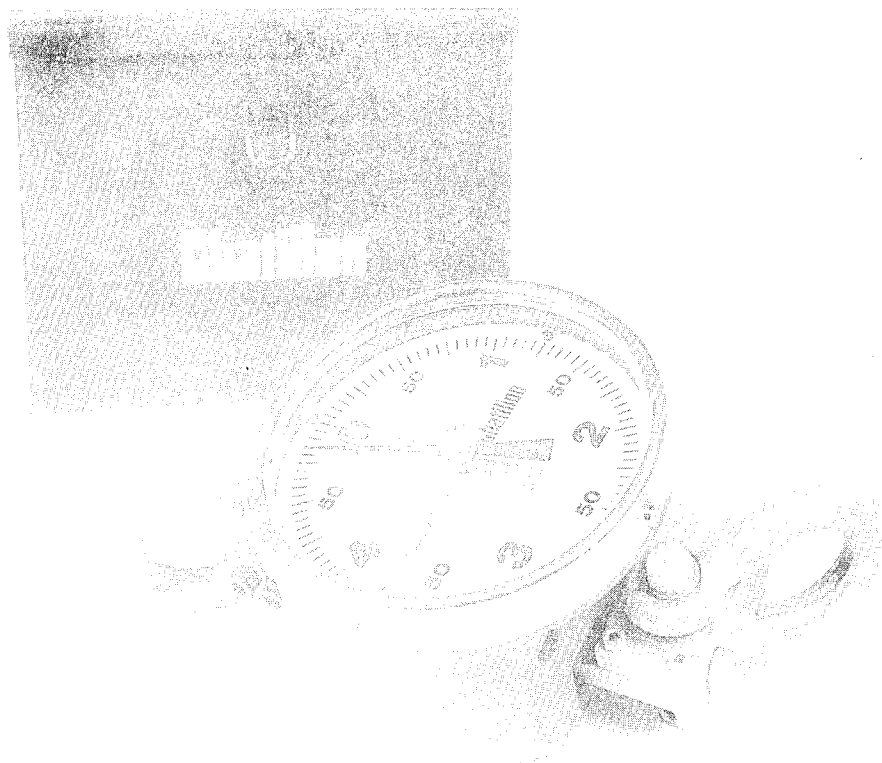


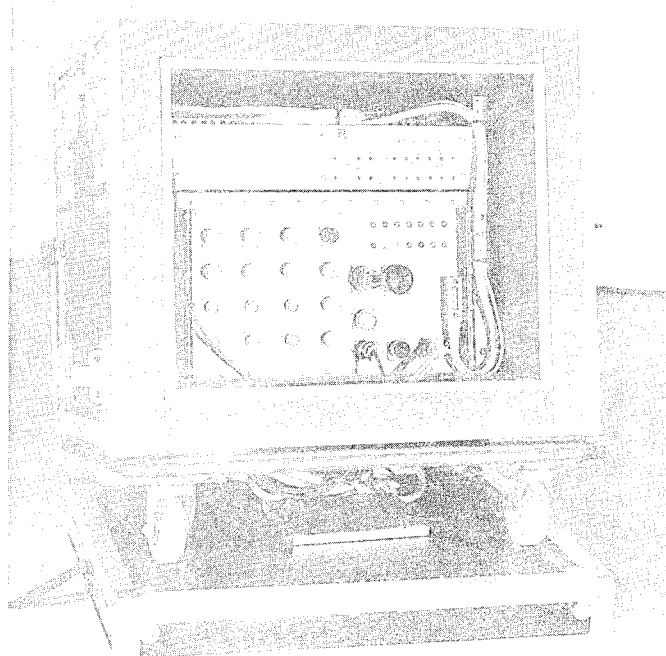
The Outdoor Environmental Pre-Conditioning Chamber is capable of temperature ranges from 270 degrees Fahrenheit to -100 degrees Fahrenheit, with a rate of change decreasing by 40 degrees Fahrenheit per minute. This chamber is portable and is used to simulate extreme environmental temperatures. The chamber can accept samples with maximum dimensions of 60 inches long, 56 inches wide, and 56 inches high.



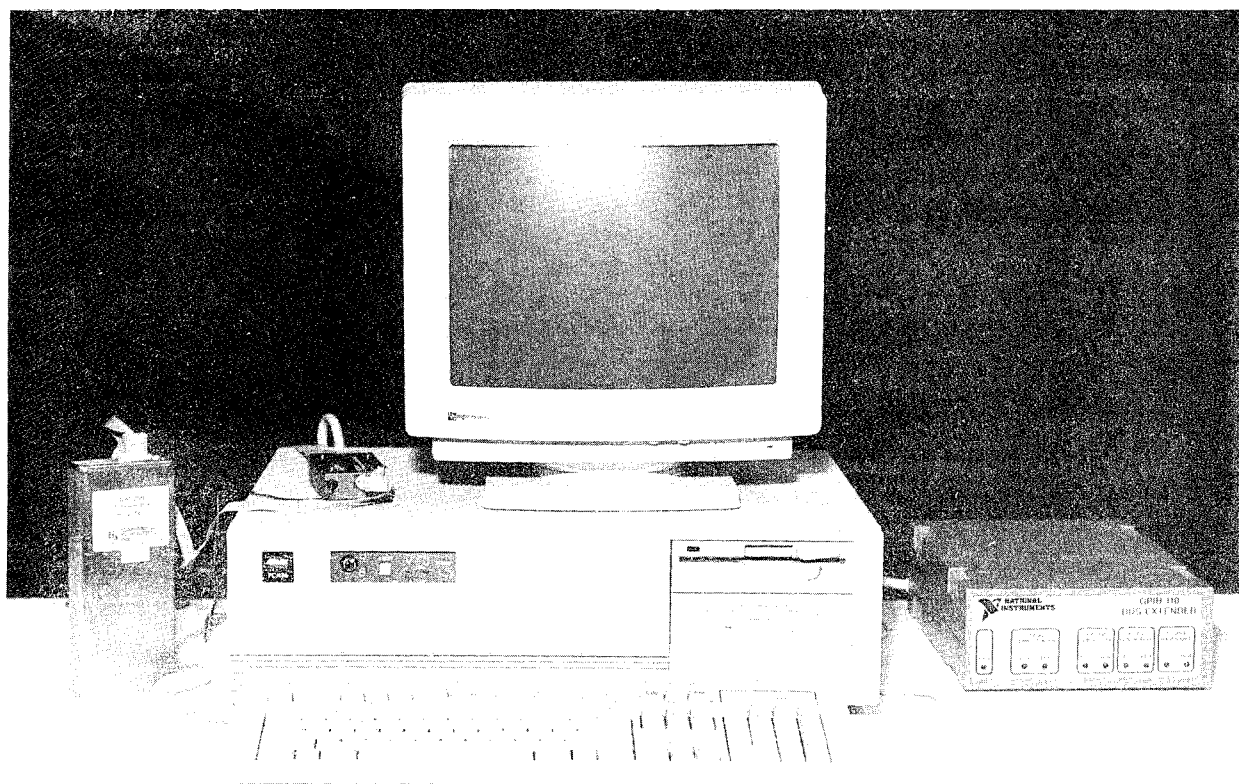
The DynaTension cable tension measuring instrument is used to determine cable tensions both before and after rail impact tests. Its overall tension range is 30 - 4,000,000 pounds and can accept cables with diameters of 1/8-inch up to 8 inches.

This second photo shows one of many Chatillon dynamometers used during cable and pull tests. They range in capacity levels from 5,000 - 50,000 pounds.

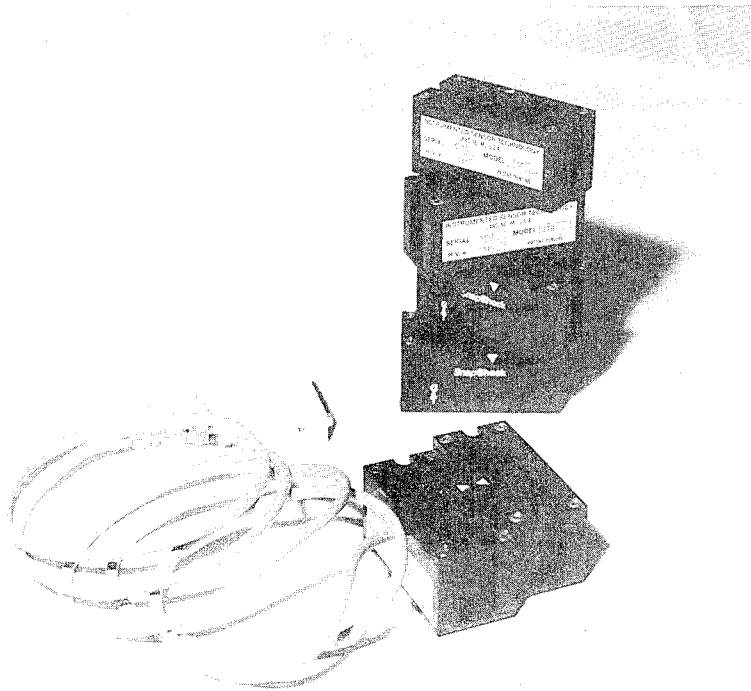




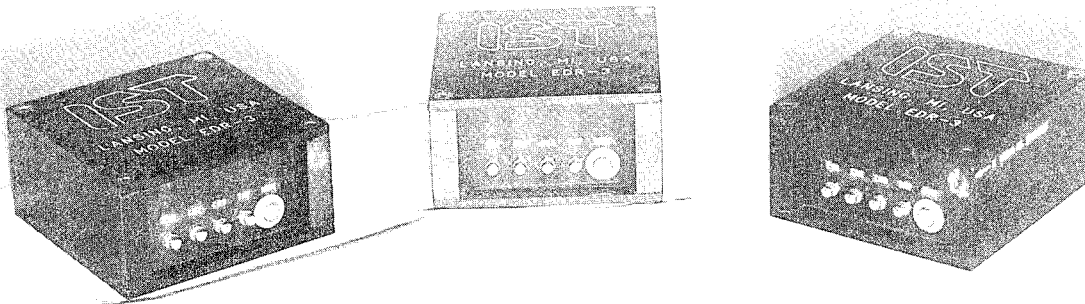
Pacific Scientific High-Speed Data Acquisition System. This unit is capable of recording 256K data points for 16 channels simultaneously at speeds of up to one million samples/second. Two independent acquisition systems give the capability of recording 32 channels of information. This equipment is primarily used in rail, road, ship, and Ammunition Peculiar Equipment (APE) testing requiring high-speed data acquisition.



The 33 MHz 80486 computer downloading system is used to download and graph data from the High-Speed Data Acquisition System at a rate of 2 minutes/channel. Capabilities include custom data and signal analysis, multi-colored/ multi-channelled plots, and world-wide data transmission via Defense Data Network (DDN) Electronic Mail (E-Mail).



SnapShock Peak Acceleration Data Loggers. Once activated for recording, each of the five data loggers can record up to a maximum of 248 peak-acceleration levels that occur within selected time periods. These time periods can be set up over a range from 0.2 seconds to 31 hours. This corresponds to a total measurement period ranging from 50 seconds to 320 days. Expected battery lives are 20 days for alkaline batteries and 70 days for lithium batteries.

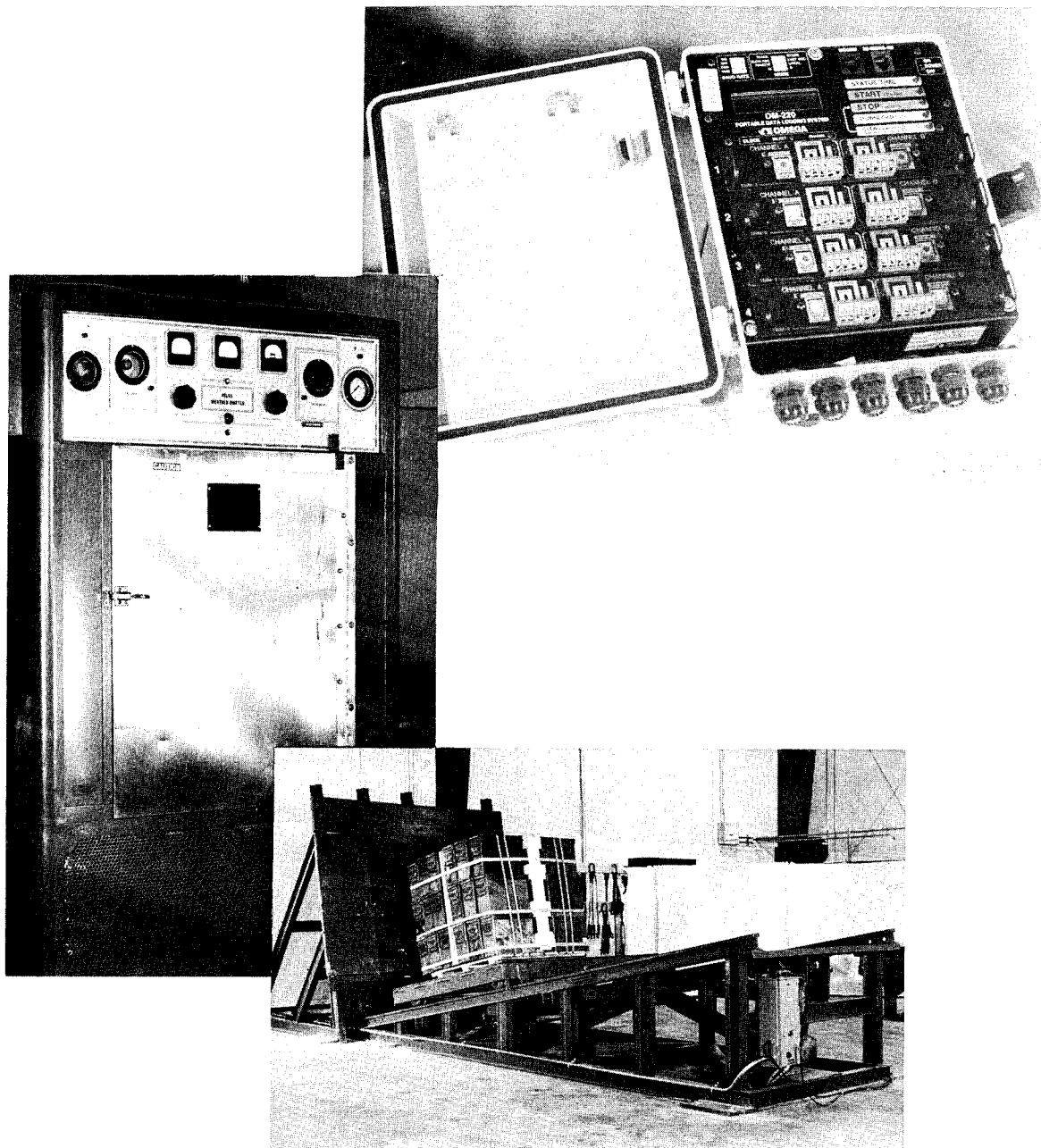


Environmental Data Recorders (EDRs). USADACS has access to three EDR-3 portable digital sensor/recorders. These recorders are designed to measure shock, vibration, temperature, and humidity. The EDR-3s can also be programmed to record only data that exceeds a certain trigger level, or they can also be configured for time-triggered recording. Its maximum event storage capacity is 5,291 events. The battery life expectancy during activation is 16 days. With dimensions of only 4.4- by 4.2- by 2.2-inches, these units can easily be packaged and shipped with a container or load for testing.

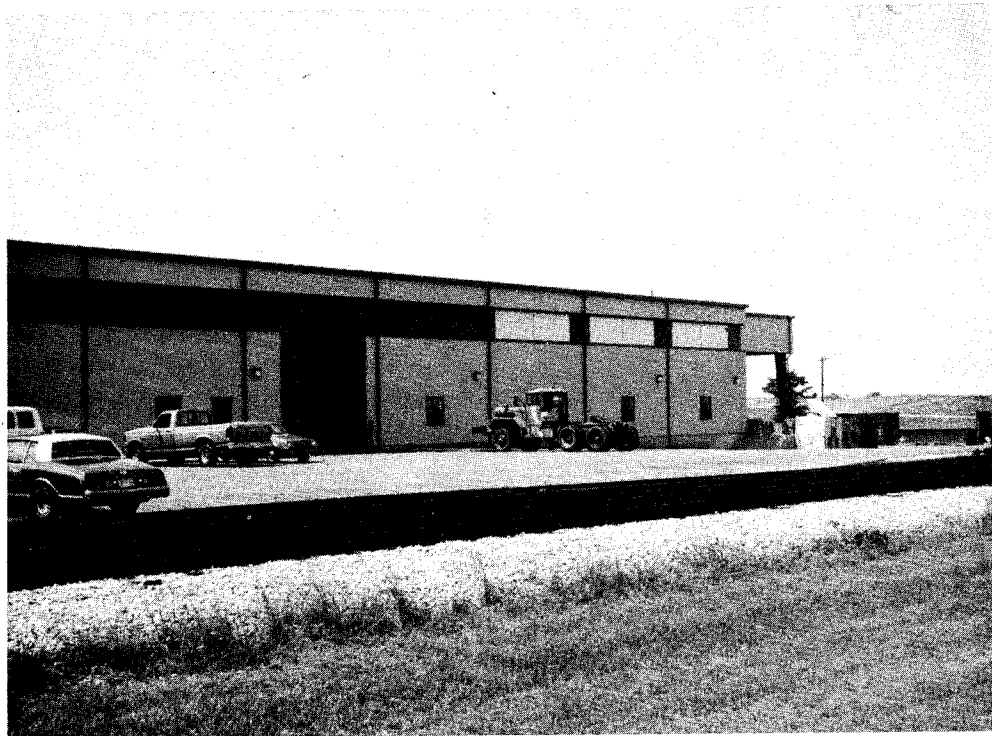
# USADACS

## Validation Engineering Division

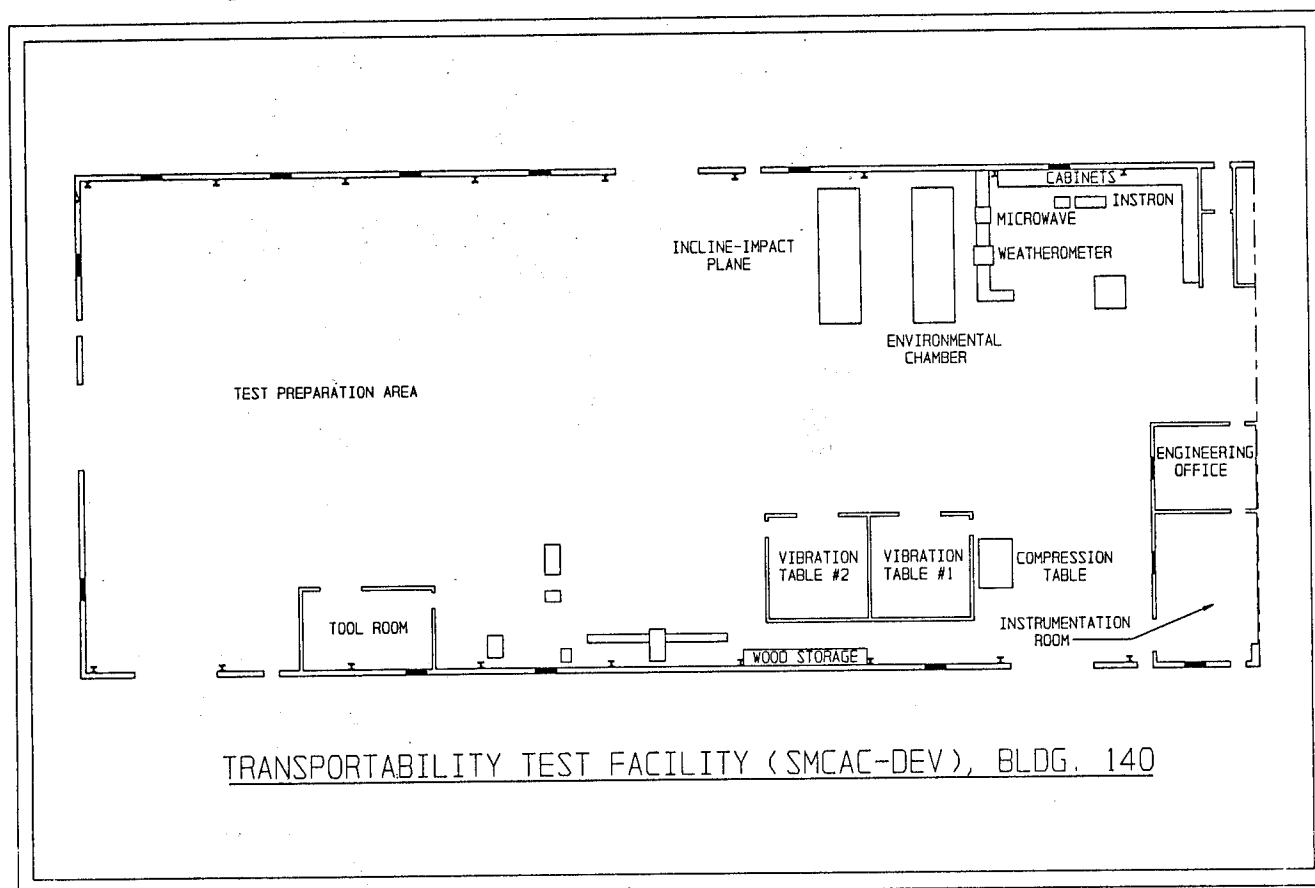
### Indoor Test Facilities





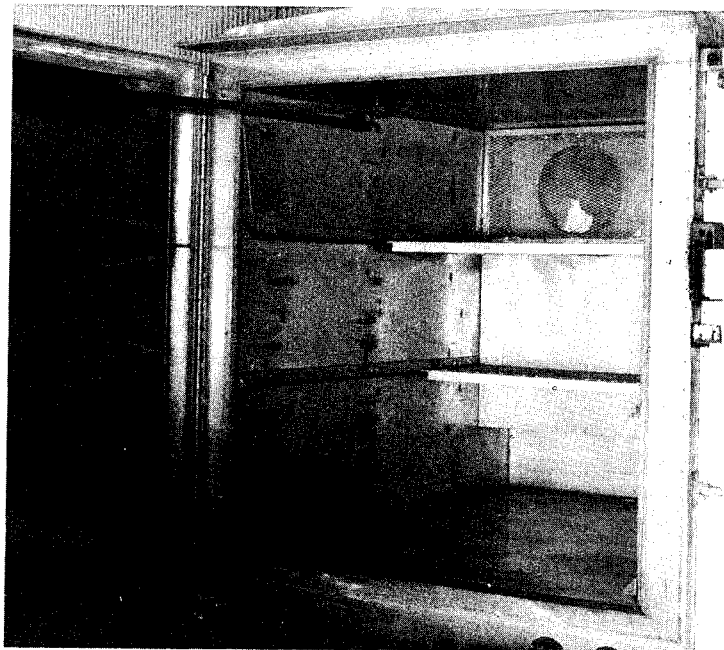
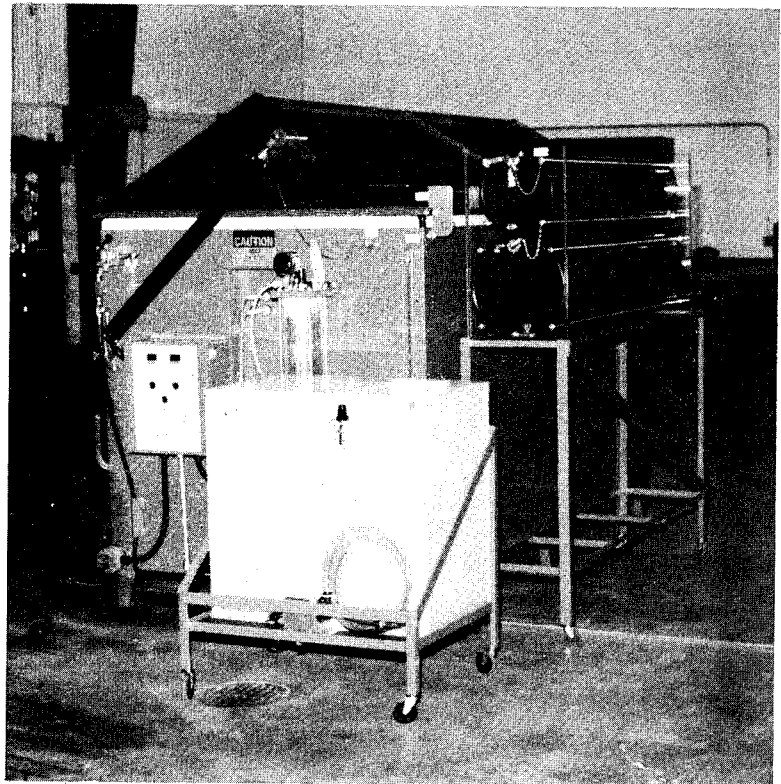


The indoor test facility houses many different types of testing equipment including the Incline-Impact Test, Compression Table, and Vibration Tables, to name a few. This building has power sources of 208-volt, single-phase and 440-volt, 3-phase. Below is a diagram of the indoor testing facility showing some of the testing equipment available.



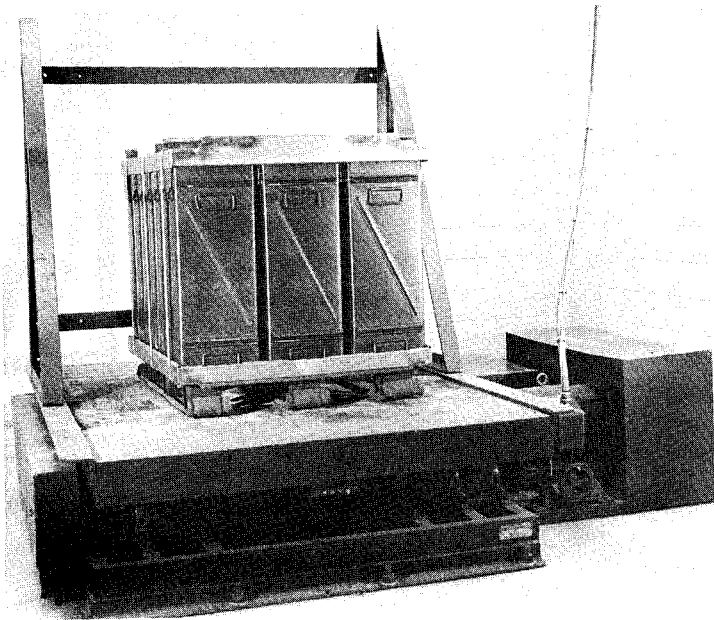


**Salt-Fog Chamber.** This chamber is capable of accepting test samples with dimensions up to 47 inches wide, 60 inches long, and 54 inches high. This chamber produces a consistently uniform free falling spray mist with uniform collection rates for all accelerated humidity, salt spray, and cass corrosion testing.

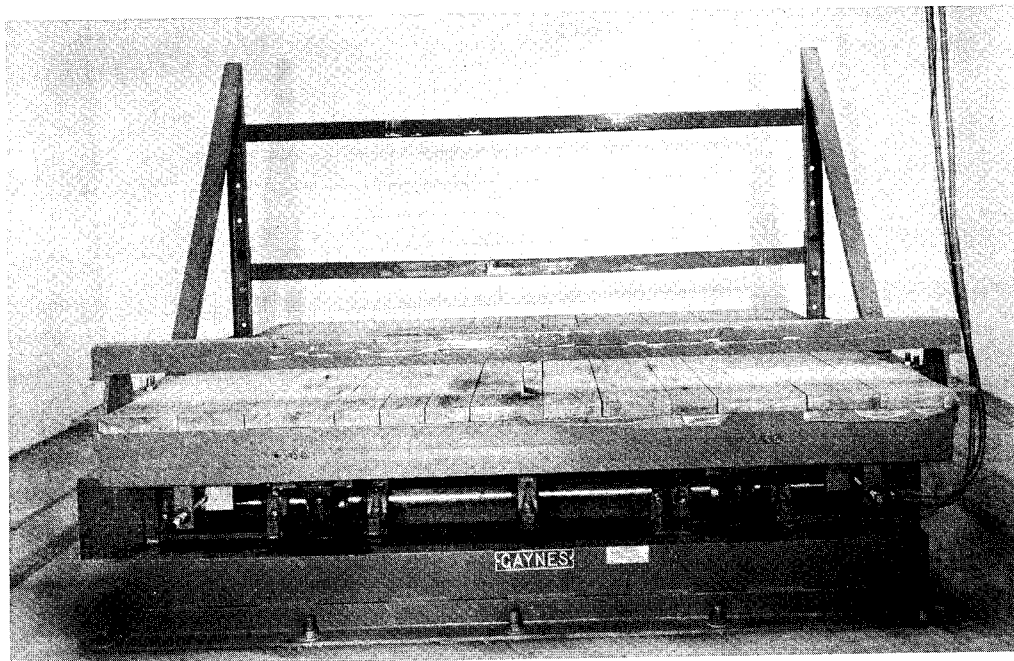


**Indoor Environmental Pre-Conditioning Chamber.** This environmental chamber is capable of temperature ranges from 270 degrees Fahrenheit to -100 degrees Fahrenheit with a rate of change decreasing by 40 degrees Fahrenheit per minute. It is used to simulate extreme environmental temperatures. The chamber can accept samples with maximum dimensions of 60 inches long, 56 inches wide, and 56 inches high. Typical systems that have been tested in the environmental chamber include the Secondary Steel Container (SSC) for chemical retrograde of ammunition from Europe as well as 40mm ammunition Performance Oriented Packaging (POP) tests.

**Low-Frequency Vibration Tables.** These tables are used to duplicate loose cargo transportation. Both units are capable of generating low-frequency vibrations of 0-5 hertz (Hz). These tables are used for MIL-STD-1660 tests as well as Performance Oriented Packaging (POP) tests. Typical tests that are capable of being conducted by these vibration tables are 5-gallon chemical decontamination agent POP testing, 81mm mortar on metal pallet, and 120mm tank ammunition in PA116 containers on metal pallet.

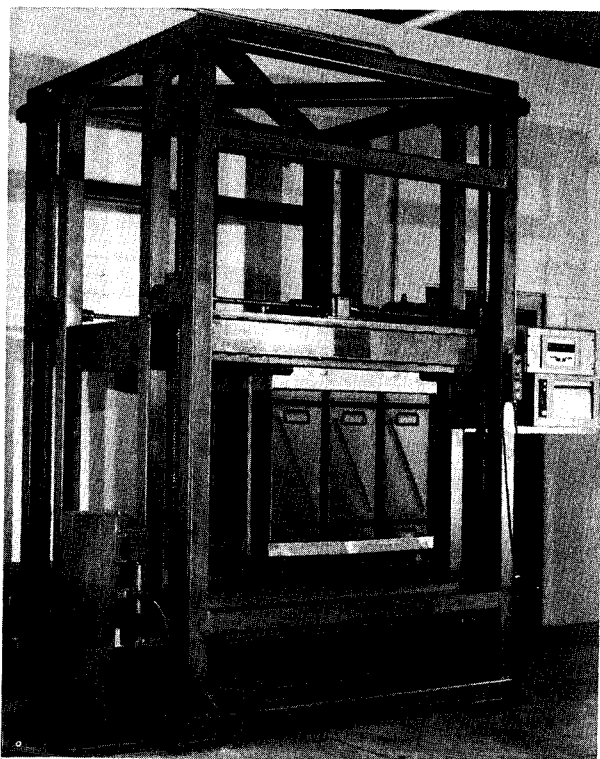
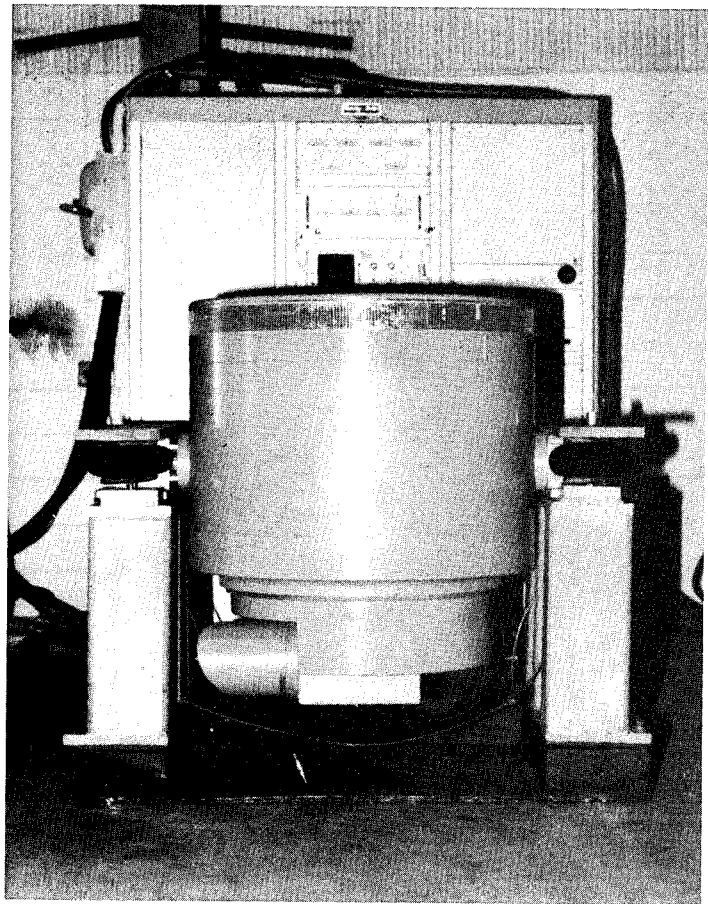


This unit has a 4,000-pound capacity and will accept test samples with dimensions up to 96 inches long, 70 inches wide, and 105 inches high.

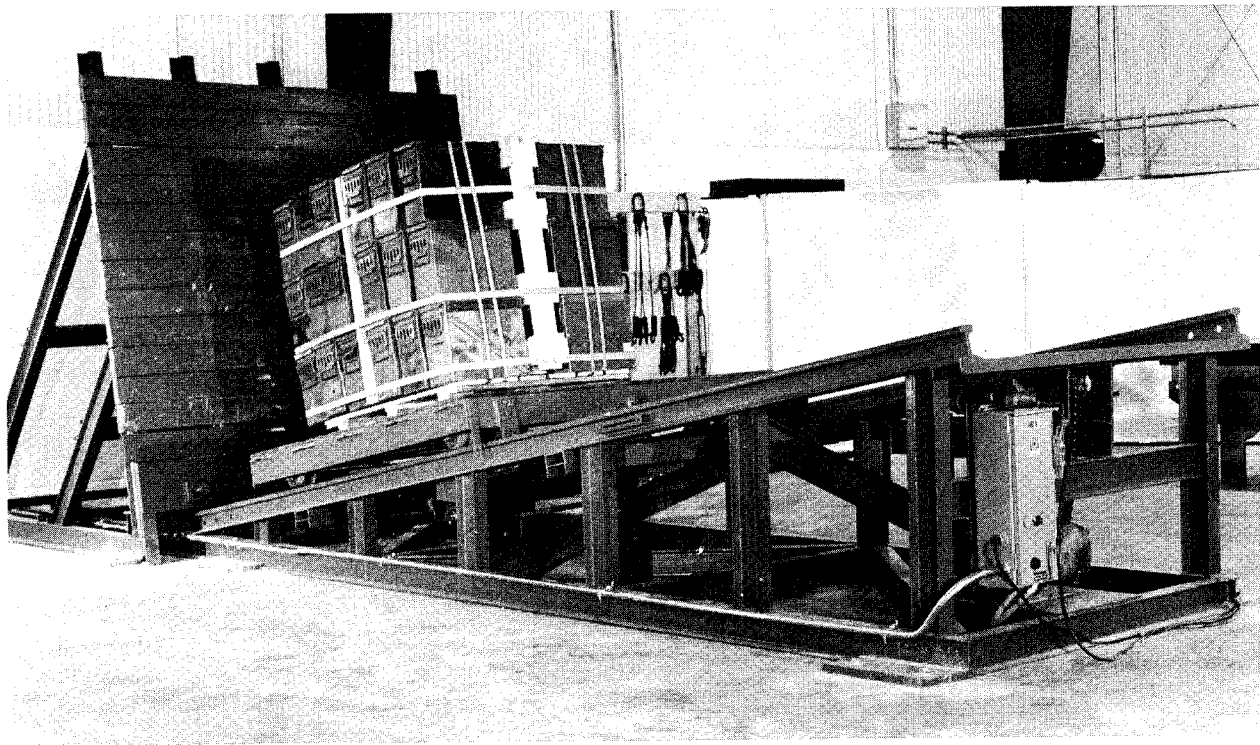


This vibration table has a 6,000-pound capacity and is capable of accepting samples of dimensions up to 96 inches long, 96 inches wide, and 100 inches high. This unit also has the capability of computer programmability causing the frequency to vary during testing.

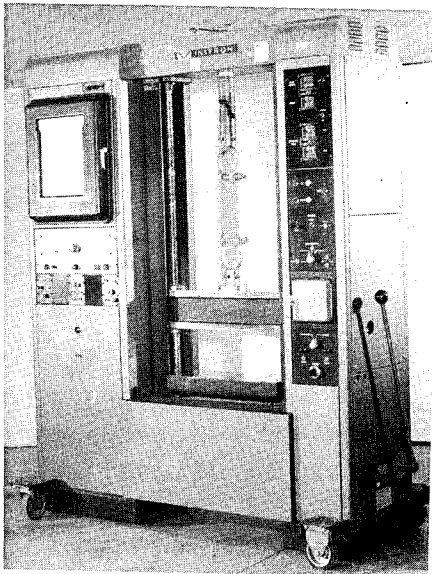
This High-Frequency Vibration Table is capable of administering vibrations between 5 and 5,000 Hz. This unit is water cooled and can accept test loads up to 300 pounds. It has a platform on which many different types of testing fixtures can be mounted. This unit is mainly used to simulate transportation of items by aircraft.



Ormond 50,000-Pound Tension/Compression Table. This table is used for MIL-STD-1660, Design Criteria for Ammunition Unit Loads, tests as well as POP tests. The table can accept samples of 58 inches long, 60-1/2 inches wide, and 72-1/2 inches high. Typical samples tested on the Tension/Compression Table are 120mm tank ammunition in PA116 containers on metal pallet, tension and compression tests of straps and cables up to 50,000 pounds, DS2 5-gallon chemical decontamination agent POP testing, and

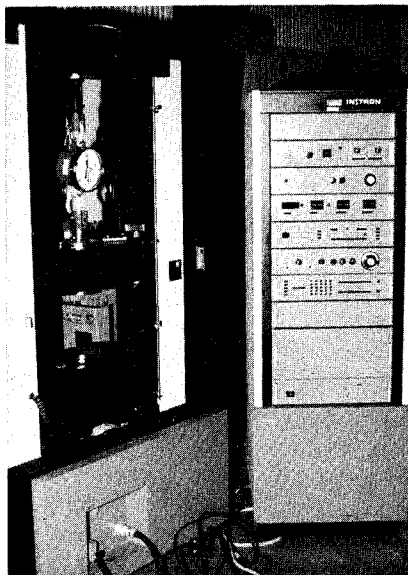
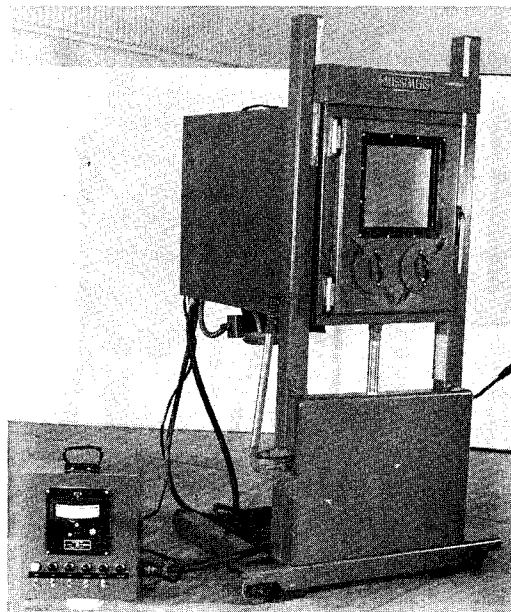


**Incline-Plane.** This piece of equipment is capable of generating impacts from 7- to 10-feet/second into a stationary wall (see appendix for chart). It is used during MIL-STD-1660 tests to verify transportability of palletized ammunition. The impact table is capable of handling samples up to 6,000 pounds, 71-1/2 inches wide, 72 inches long, and 80 inches high. Typical test samples include 155mm metal Field Artillery Projectile Pallet (FAPP), 40mm containers, and 2.75-inch rocket metal pallet adapters.



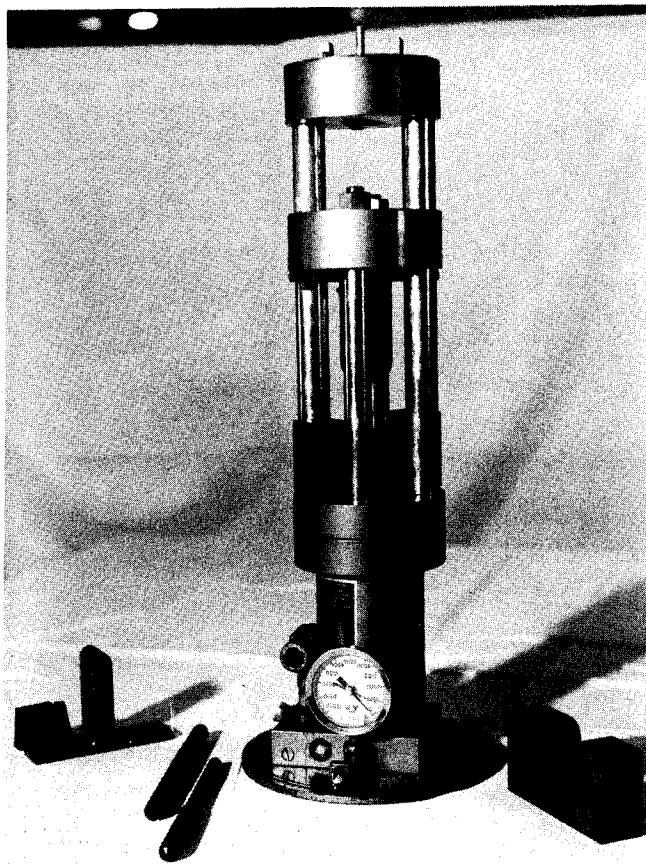
**Instron 10,000-pound Tension/Compression Unit.** This unit is capable of cyclical repetitive load/unload cycles that duplicate mechanical stresses on materials such as strapping, banding, etc.

**Associated Environmental Chamber .** This chamber is used with the Instron 10,000-Pound Tension/Compression tester to pre-condition test samples from 400 degrees Fahrenheit to -100 degrees Fahrenheit prior to testing. This chamber can also be used for thermal shock testing. It is capable of dropping from 400 degrees Fahrenheit to -100 degrees Fahrenheit at 26 degrees Fahrenheit per minute. The chamber dimensions are 20 inches high, 20 inches long, and 14 inches wide.



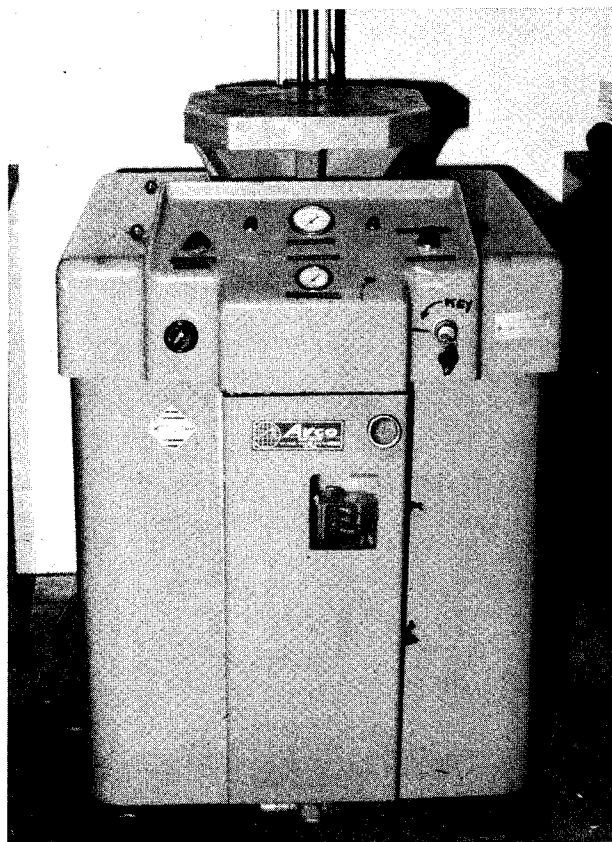
**Instron 20,000-Pound Tension/Compression Unit.** This unit is also capable of administering repetitive load/unload cycles that duplicate mechanical stresses on materials such as straps and banding. This unit is capable of administering loads up to 20,000 pounds.



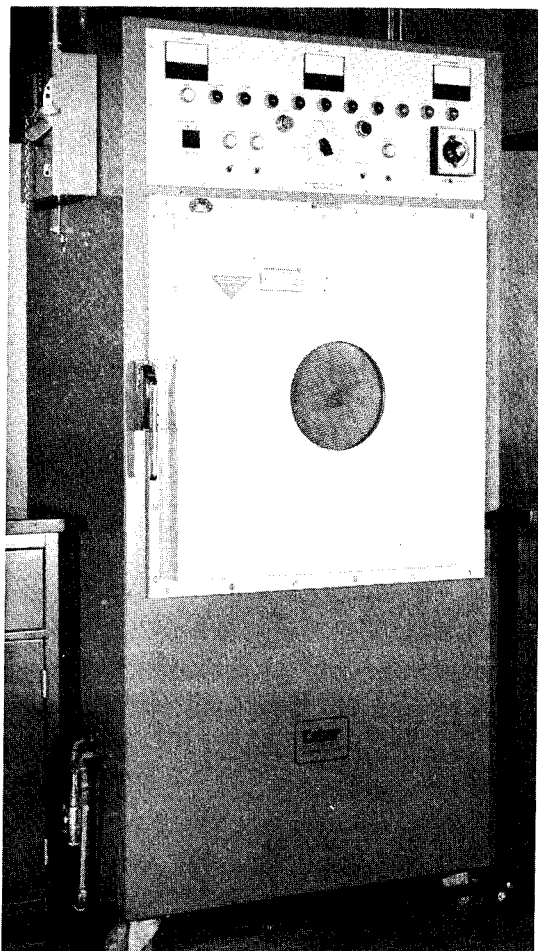
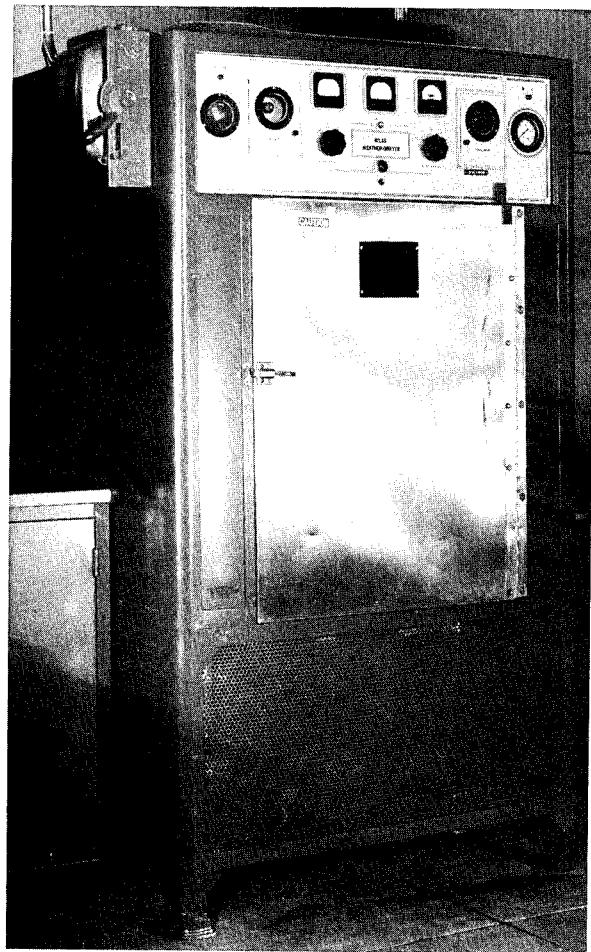


50,000-Pound Weld Tension/Compression Pull Tester. This piece of equipment is mainly used to test weld strength, but it can also be used to test banding and strapping strength. Unlike the Ormond Tension/Compression Table, this tension/compression tester is small and

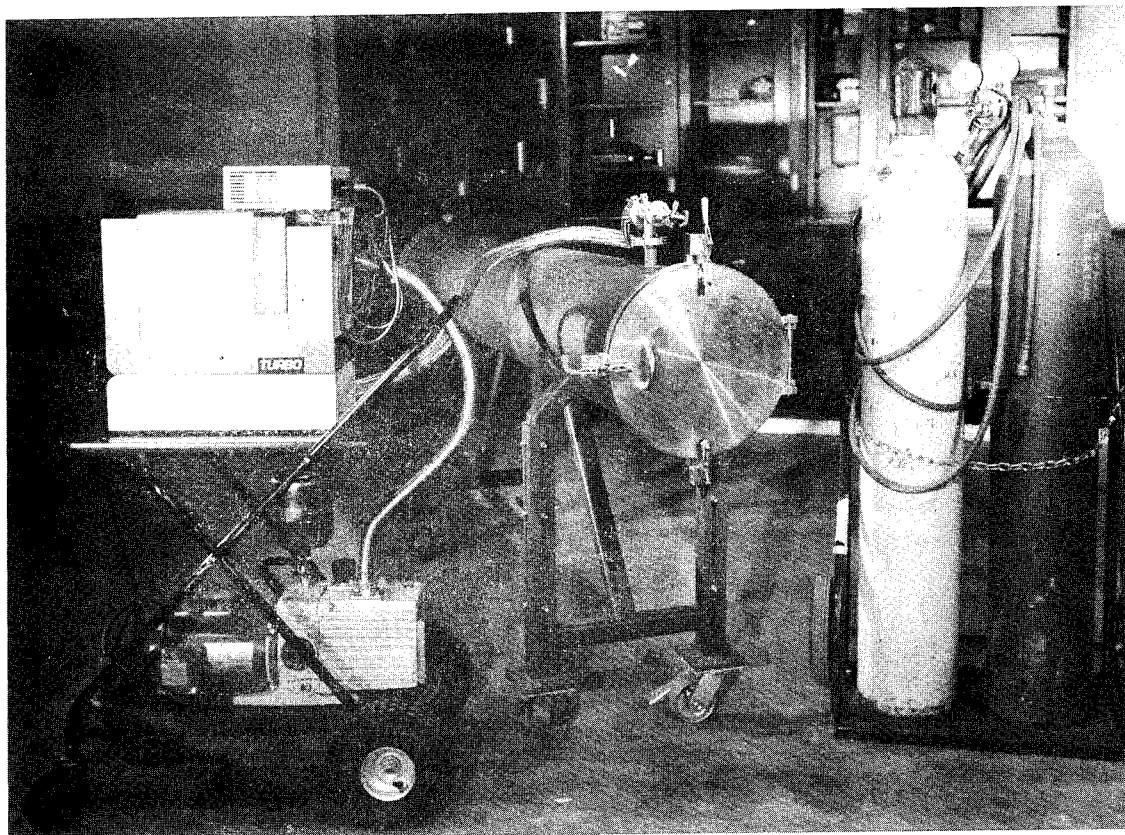
Avco Shock Machine. This shock tester is capable of producing shocks up to 400 g's. This machine has a testing platform of 16 inches long by 16 inches wide with many different tiedown positions.



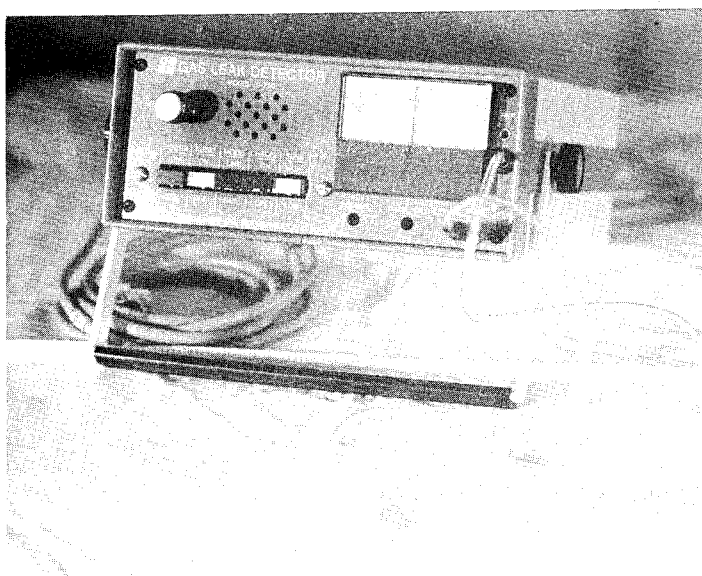
Atlas Weatherometer. This is an ultraviolet (UV) accelerated aging chamber used to simulate sunlight in UV deterioration of ammunition-related items. It has a voltage range of 200-240 volts and a temperature range of 0-40 degrees Celsius. Inside chamber dimensions are 32-1/2 inches high, 40-1/2 inches wide, and 39 inches long. This chamber can accept 54 samples at one time and uses a 3 carbon-arc UV acceleration system. A water conditioning cycle also can be administered every 2 hours. The entire system can be operated in cycles between 1- and 24-hour periods. Typical test items include wooden synthetic components used in related ammunition items.



Cober 2.5 KW Microwave Radiation Furnace. This furnace is used for thermal shock testing of ammunition-related items. The furnace oven can accept samples up to 100 pounds with dimensions of 21-1/2 inches high, 22 inches wide, and 24 inches long. The maximum power output into the oven cavity is 2.5 KW and is smoothly adjustable down to 200 watts. Typical test samples include plastic and nonmetallic materials.

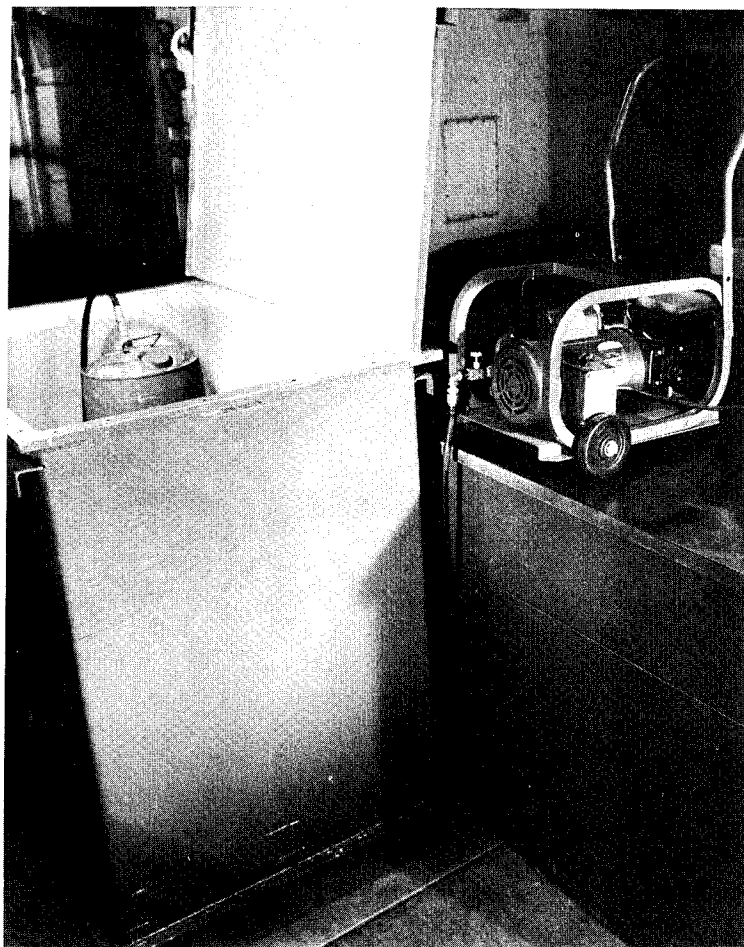


**Mass Spectrometer and Associated Equipment.** This equipment can measure leaks in the  $10^{-4}$  to  $10^{-9}$  cc/he/atm/sec. A hand probe can also be used with accuracy up to  $10^{-6}$  cc/he/atm/sec. The mass spectrometer is used to verify leak integrity of chemical shipping and storage containers. It consists of a 3-pump system, including a rotary pump with a displacement of 400 liters/minute and a rotational speed of 1,725 rpm. From there, the samples go through another internal pump and finally to the Turbovac Pump, which has a pumping speed of 33 to 55 ltr/sec and a rotational speed of 72,000 rpm.



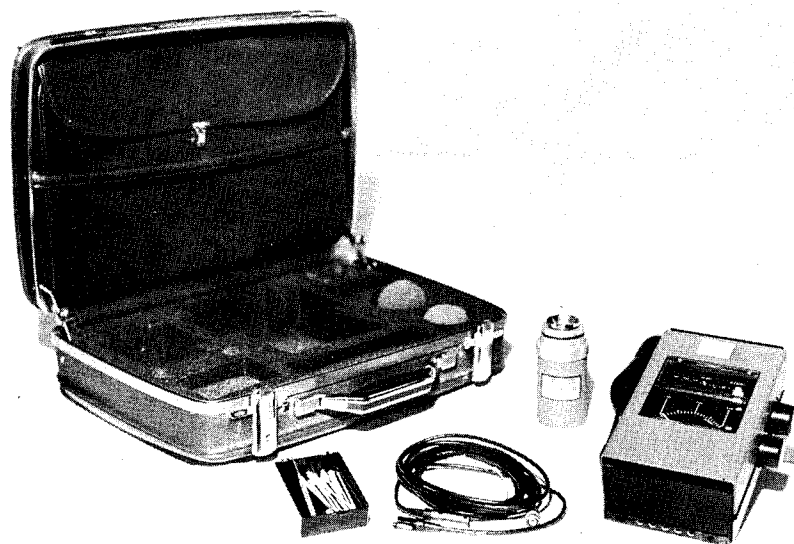
**Gallmac Gas Leak Detector.** This unit is capable of sensing gas leaks, such as helium, argon, and carbon dioxide, with relative sensitivity minimums of  $10^{-5}$  cc/sec,  $10^{-4}$  cc/sec, and  $1.1 \times 10^{-4}$  cc/sec.





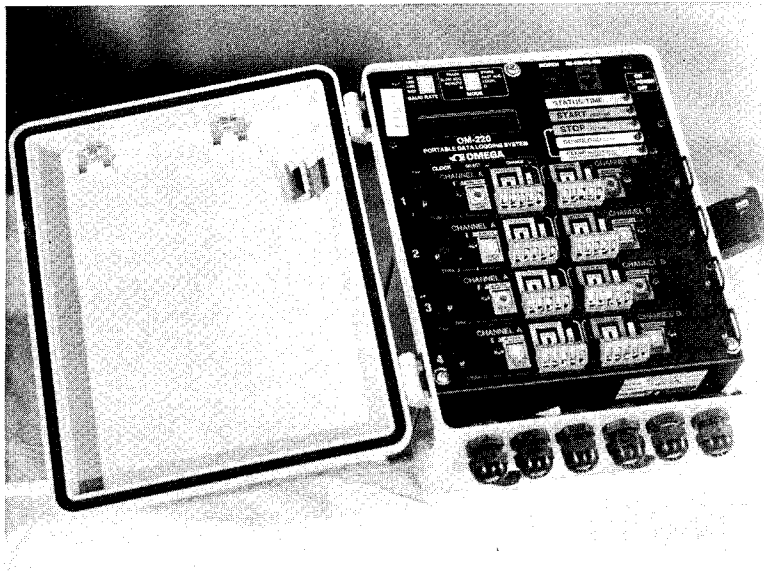
**Hydrostatic Test Equipment.** This equipment is capable of generating pressures of 10 to 1,000 psi. It is used for POP testing as well as structural integrity of chemical storage and shipping containers. The holding container can accept samples with maximum dimensions of 42 inches high, 41 inches long, and 29-1/2 inches wide.

**The Precision Sound-Level Meter and Analyzer.** This portable sound analyzer is intended to make precision sound-level measurements and octave band analyses. It is capable of operating for 20 hours on self-contained batteries and record data for later analysis. This sound meter has range levels of 10 to 130 dB with 1-inch microphone and 20 to 140 dB with a 1/2-inch microphone.



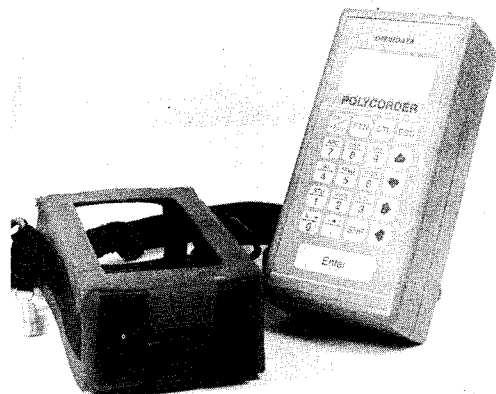
These are a few of the portable data recorders that USADACS has to record long-term storage tests of temperature and humidity on ammunition.

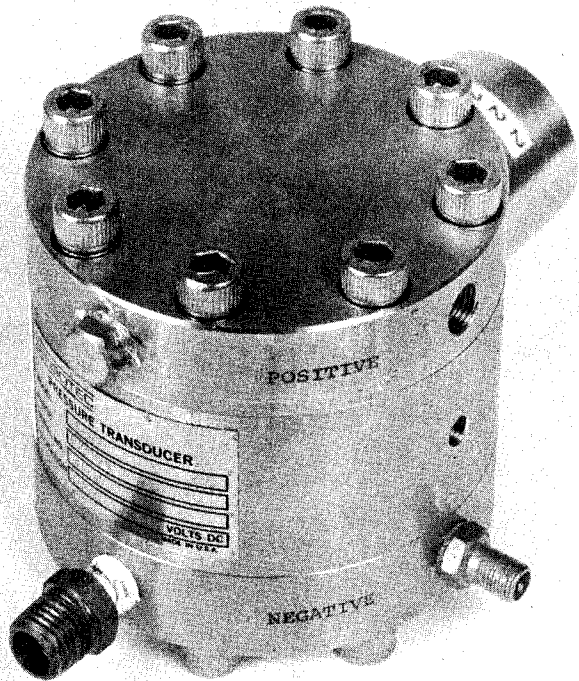
The 21X Micrologger has 978 bytes of allotted program memory. Its maximum rate for fast single-ended measurements with standard software is 256 per second (16 measurements repeated 16 times per second). The 21X is used in compliance with the Campbell Scientific Storage Modules 716 for long-term tests. The SM 716 is equipped with a battery-backed, solid state CMOS Random Access Memory (RAM) in a stainless steel canister containing 716,672 bytes of RAM for data and program storage.



The OM-220 is most commonly used in applications where it is set up onsite for long periods of time. This model is extremely easy to set up and use. It is weatherproof and ready for stand-alone onsite use. The OM-220 also has a one to eight channel 12-month recording capability with a 2-year memory backup.

The Polycorder is an environmentally sealed data acquisition system with a maximum of 448,000 bytes of RAM. It is capable of four programmable digital inputs/outputs and has a built-in RS-232, which allows files to be transferred between the Polycorder, it also contains three types of files including a format file, data file, and program file used to store Polycorder instructions that acquire, store, and manipulate the data.

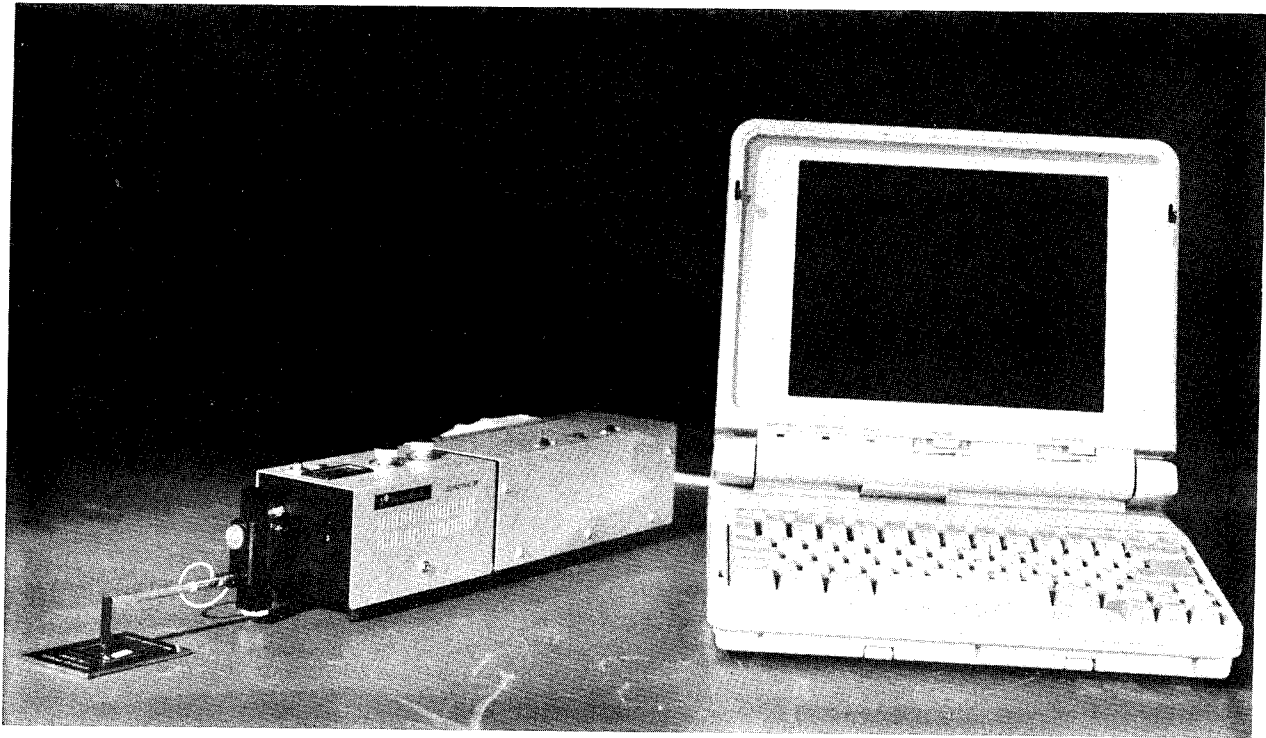




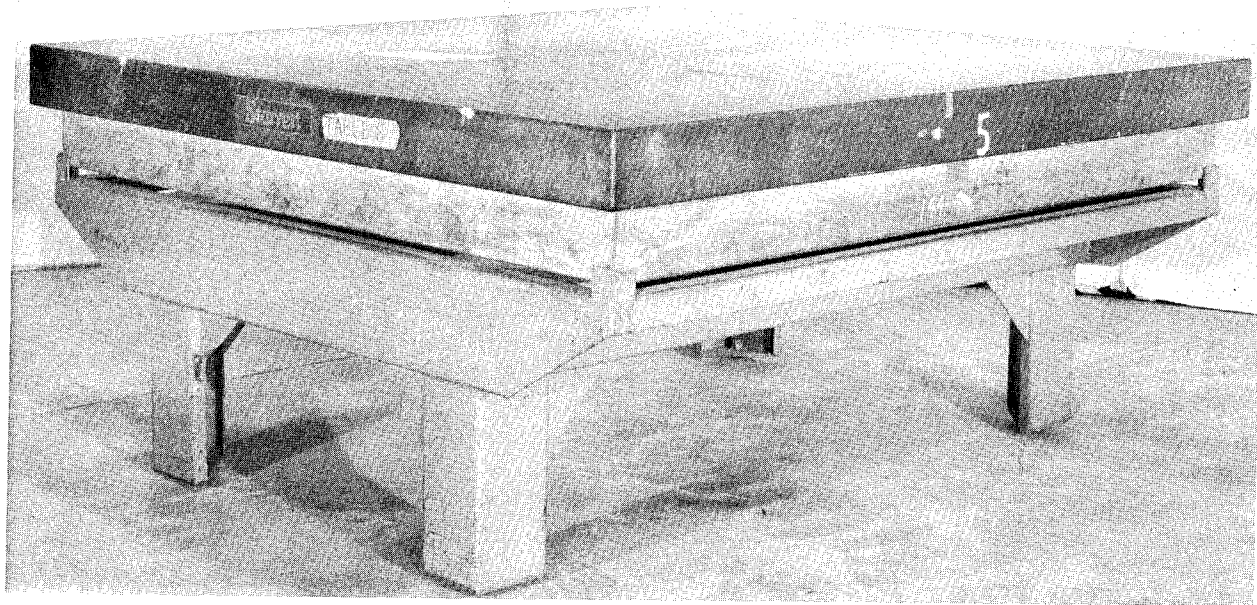
Below is one of a wide range of Sensotec pressure transducers used during precision leak rate testing. This particular pressure transducer has a pressure range from 0.5 to 25.0 psid.

Panametrics ultrasonic thickness gage is used to determine coating thicknesses on ammunition-related items. This gage has a measurement range of 0.05 inches to 20 inches at a rate of 2 measurements per second.





The computer interfaced profilometer is capable of measuring surface imperfections as small as 5 millionths of an inch at speeds of .04 in/sec for measurement and .01 in/sec for recording.

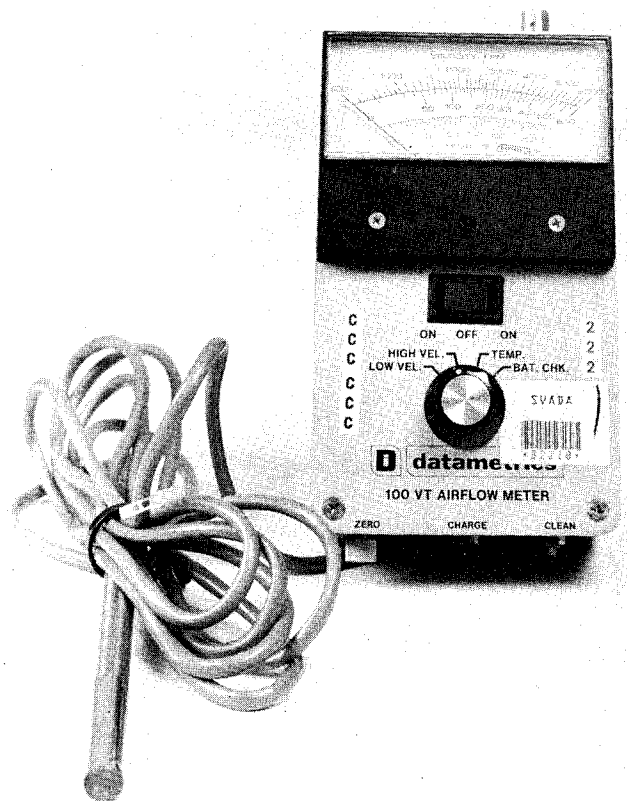


This 96- by 96-inch surface plate is used to inspect test items for any irregularities or warping both before and after testing.



Delmhorst Moisture Detector. This detector determines moisture content of wood and related items used in the shipment and storage of ammunition. It has a detection range of up to 80 percent

Datametrics Air Velocity Meter. This meter is used to measure air flow in shipping and storage containers. It can measure velocities up to 98.43 ft/sec and has a battery operating length up to 7 hours.



# **APPENDIXES**

## **APPENDIX**

### **POINTS OF CONTACT ADDRESS DIRECTORY**

**MAILING ADDRESS:** Director  
U.S. Army Defense Ammunition Center and School  
ATTN: SMCAC-DEV (Designated Individual)\*  
Savanna, IL 61074-9639  
\* Jerome H. Krohn  
\* Quinn D. Hartman  
\* Alfred C. McIntosh, Jr.  
\* William R. Meyer  
\* Jason B. Solberg

#### **SHIPPING ADDRESSES:**

**TRUCK:** Transportation Officer  
Savanna Army Depot Activity  
ATTN: SMCAC-DEV  
Savanna, IL 61074-9639  
MARK FOR: W81AOR

**RAIL:** Transportation Officer  
Savanna Army Depot Activity  
ATTN: SMCAC-DEV  
Proving Ground, IL  
MARK FOR: W81AOR

**MESSAGE ADDRESS:** DIR USADACS SAVANNA IL //SMCAC-DEV//

**E-MAIL ADDRESS:** SMCACDEV@SAVANNA-EMH1.ARMY.MIL

**TELEPHONE:** 815-273-8929/8908 (commercial)  
585-8929/8908 (DSN)

**DODAC: UIC:** W3GMAA

**DODAC OF PROPERTY:** W52G2J  
**BOOK OFFICER AT**  
**SVADA**

**DATAFAX NO.:** 815-273-8811 (commercial)  
585-8811 (DSN)

## VISITORS GUIDE

### GENERAL INFORMATION

#### *Location*

The U.S. Army Defense Ammunition Center and School (USADACS), Validation Engineering Division (SMCAC-DEV), located on the Savanna Army Depot Activity (SVADA), approximately seven miles north of Savanna, IL, off Illinois Route 84, performs four distinct testing operations, namely, transportability testing, pallet/laboratory testing, ammunition peculiar equipment (APE) testing, and equipment evaluation and demonstrations. The U.S. Army Defense Ammunition Center and School is generally reached by rental car from either Chicago (155 miles) or Moline (65 miles).

#### *Security Processing*

Security badging and issuance of car passes are accomplished at the main gate. You will be requested by the on-duty guard to park in the parking lot on the right immediately after passing through the gate and to return to the guard post to receive a badge and car pass.

Tests are usually unclassified; therefore, security clearance is not required. If the test announcement indicates a security clearance requirement, a letter or message should be sent to Director, U.S. Army Defense Ammunition Center and School, ATTN: SMCAC-DEV, Savanna, IL 61074-9639, with an information copy to SMCAC-AST (Security Manager).

Cameras or any video recording equipment transported on post must be registered at the Security Office in building 132. The Security Office must have make, model, and serial number of video equipment for the issuance of the camera pass. Pass must be turned in to the Security Office upon completion of visit to USADACS.

#### *Reporting*

Upon arrival at USADACS and completion of security badging, test attendees should report to the Validation Engineering Division located in the west end of building 134 and report in with the Validation Engineering Division Chief or test engineer.

#### *Government Quarters Availability*

Government quarters are not available. There are a number of modern motels available within the immediate area.

#### *Dining Facilities*

A dining facility is located on post. A number of restaurants are located within surrounding communities.



### *Attire*

Transportability testing and equipment demonstration/evaluation are conducted at the Transportability Test Facility located behind building 134.

Tests are conducted throughout the year. Test attendees should dress according to the season, since climatic conditions can range from extremely hot and humid in the summer to subzero temperatures in the winter. The temperatures and precipitation information are provided here:

ILLINOIS (QUAD CITIES AREA) WEATHER DATA			
<u>MONTH</u>	Average Daily High (Degrees F.)	Average Daily Low (Degrees F.)	Average Number of Days with at Least .01 Inch of Precipitation
January	30.0	13.0	9
February	34.3	17.0	8
March	45.0	26.4	11
April	61.3	39.8	11
May	72.0	50.2	12
June	81.4	60.2	10
July	85.2	63.8	9
August	83.8	62.0	9
September	76.0	53.2	9
October	66.0	42.8	7
November	48.1	30.2	8
December	34.6	18.5	9

## SAFETY IN TESTING

### *General*

Upon arriving at USADACS, all test attendees should contact the test engineer or other persons designated as the point of contact. If test preparations are still in progress, attendees will be directed to a conference room. In most cases, all test preparations will have been accomplished ahead of time, and test attendees will be permitted to proceed to the test area.

### *Transportability Testing*

Before test attendees inspect the test item, they must contact the test engineer or other person designated as point of contact to assure the railcar, trailer, or other test item will not be moved. Test attendees are cautioned not to touch or move test instrumentation.

During performance of test, attendees must observe from a safe distance (at least 25 feet). Attendees must remain at a safe distance until released by the test engineer.

Although a rail impact or a road test may appear to have stopped, the conductor or truck driver may wish to make further movements before permitting visitor inspection. The test engineer will remain in contact with the conductor or truck driver and will await their release of the test load before permitting any visitor inspections.

Safety equipment such as hard hats, safety glasses, etc., will be furnished by USADACS as deemed necessary. Safety shoes, gloves, etc., although not generally required, will be the responsibility of the test attendees.

### *Pallet/Laboratory Testing*

Pallet/Laboratory testing is conducted in the rear one-third of building 140. Test attendees will report to the Validation Engineering Division located in building 134 after completion of security badging.

The assigned test engineer will, after completion of all necessary administrative matters, escort test attendees to the test laboratory in building 140.

Test attendees will comply with the directions of the test engineer. During operation of any test apparatus, test attendees will remain at least 10 feet from the operation.

Safety equipment will be issued when required. Safety glasses are required at all times.

Test attendees are required to wear double ear protection during operation of the vibration table whenever within 25 feet of the test apparatus.

During operation of the tension/compression test in the tension mode, test attendees will remain behind a barricade or the lucite shield per test engineer's direction.

### *Ammunition Peculiar Equipment (APE)*

Ammunition Peculiar Equipment (APE) testing is conducted within the ammunition area. Upon arrival and security badging, attendees will report to either the Validation Engineering Division test engineer or the Maintenance Engineering Division project engineer. These individuals will brief you on the operation, the standing operating procedure (SOP), and other particulars required for safety prior to departing for the test site.

## MATERIAL HANDLING EQUIPMENT (MHE) AND SPECIFICATIONS

TRUCK, TRACTOR: 5-Ton, 6x6, W/Winch, W/E

Model Number: M818

Payload: 15,000 lbs.

Towed Load Allowance: 37,500 lbs.

Weight: 20,955 lbs.

TRUCK, TRACTOR: 5-Ton, 6x6, WO/Winch

Model Number: M818

Payload: 15,000 lbs.

Towed Load Allowance: 37,500 lbs.

Weight: 20,290 lbs.

TRUCK, CARGO: 5-Ton, 6x6, Drop Side, W/Winch, W/E

Model Number: M925A1

Payload: 10,000 lbs.

Towed Load Allowance: 15,000 lbs.

Weight: 22,575 lbs.

TRUCK, CARGO: 2-1/2 Ton, 6x6, WO/Winch

Model Number: M35A2

Payload: 10,350 lbs, Off Road: 7,000 lbs.

Towed Load Allowance: 6,000 lbs.

Weight: 13,700 lb

TRUCK, CARGO: 1-1/4 Ton, 6x6, W/E

Model Number: M561

Payload: 2,500 lbs.

Towed Load Allowance: 6,000 lbs.

Weight: 7,300 lbs.

TRUCK, UTILITY: 1-1/4 Ton, 4x4, Cargo/Troop Carrier, HMMWV, W/E

Model Number M998

GVW: 7,500 lbs.

Towed Load Allowance: 3,400 lbs.

Weight: 4,971 lbs.

Amount: 2

TRUCK, CARGO: 1-1/4 Ton, 4x4  
Model Number: M1008  
Payload: 2,900 lbs.  
Towed Load Allowance: 3,000 lbs.  
Weight: 5,900 lbs.

TRUCK, CARGO: 10-Ton, 8x8, HEMTT, W/Winch  
Model Number: M977  
Payload: 22,000 lbs.  
Towed Load Allowance: 40,000 lbs.  
Weight: 37,857 lbs.

TRUCK, STAKE: Ford flatbed truck  
Payload: 15,000 lbs.  
Bed Dimensions: 84- x 162-inches  
Weight: 7,000 lbs.

TRUCK, CARGO: 10x10, Pallatized Loading System (PLS)  
Model Number: XM-1074 GVWR: 84,000 lbs.  
GCWR: 134,100 lbs.  
Weight: 48,800 lbs.  
Amount: 2  
\* Equiped with 5 PLS flatracks,  
which can be attached to MILVANs  
for quick load and unload operations.

SEMITRAILER, STAKE: 12-Ton, 4 Wheel  
Model Number: M127A2C  
Payload: 24,000 lbs.  
Bed Dimensions: 96-3/4 x 348-1/4 inches  
Weight: 13,840 lbs.

SEMITRAILER, DUAL PURPOSE: 22-1/2 Ton, Breakbulk Container, Transporter  
Model Number: M871  
Payload: 45,000 lbs.  
Bed Dimensions: 96- x 358-inches  
Weight: 16,000 lbs.

LIFT, HYSTER: for MILVAN containers  
ID Number: 2248B  
Lift Capacity: 50,000 lbs.

LIFT, TRUCK: Model Number: H40-XL-MIL  
Diesel Engine  
Lifting Capacity: 4,000 lbs.  
Weight: 8,703 lbs.

LIFT, TRUCK: Gasoline Engine  
Model Number: H50H  
Lifting Capacity: 4,000 lbs.

LIFT, CHRYSLER: All Terrain Vehicle (ATV), Crab Walking, Side Hill Leveling  
ID Number: 2249B  
Lift Capacity: 6,000 lbs.

LIFT, ALL-TERRAIN:  
Lift Capacity: 10,000 lbs.  
Weight: 35,000 lbs.

LIFT, ALL-TERRAIN: MILVAN lift  
Model Number: 988B  
Lift Capacity: 50,000 lbs.  
Weight: 63,000 lbs.

MILVAN, U.S. AIR FORCE (USAF): end-opening  
MGW: 44,800 lbs.  
Weight: 6,200 lbs.  
Amount: 2

MILVAN, USAF: side-opening  
MGW: 46,860 lbs.  
Weight: 6,050 lbs.  
Amount: 5

MILVAN, U.S. ARMY (USA): end-opening  
MGW: 44,800 lbs.  
Weight: 5,900 lbs.  
Amount: 10

1/2-HIGH MILVAN, USA: end-opening  
MGW: 52,910 lbs.  
Weight 4,775 lbs.

ROLLER PALLET, USA: Used for easy loading/unloading  
of MLRS containers into MILVANS.  
Capacity: 22,000 lbs.

ROLLER PALLET, USA: Used for easy loading/unloading  
of MLRS containers into MILVANS.  
Also, has attachable landing legs for  
difficult loading/unloading  
situations.  
Capacity: 20,000 lbs.  
Amount: 2

ROLLER PALLET, USA: Used for general purpose MILVAN loading.  
Capacity: 40,000 lbs.

1/4-RACK, USA: End walls, but not fully enclosed.  
MGW: 53,760 lbs.  
Weight: 6,085 lbs.

1/2-RACK, USA: End walls, but not fully enclosed.  
MGW: 53,760 lbs.

FULL-RACK, USA: End walls, but not fully enclosed.  
MGW: 53,760 lbs.  
Weight: 7,210 lbs.

VANS, COMMERCIAL:  
Dimensions: 20x8x8-feet  
MGW: 44,800 lbs.  
Weight: 4,100 lbs.  
Amount: 3

FULL-RACK, COMMERCIAL: End walls, but not fully enclosed.  
MGW: 66,139 lbs.  
Weight: 5,732 lbs.

CHASSIS, USA: Used to haul MILVANS by truck  
to remote locations.  
Amount: 5

## TYPICAL ITEMS TESTED IN THE PAST

<u>TITLE</u>	<u>NUMBER</u>
1-TON CHEMICAL STORAGE CONTAINER	EVT 30-90
105MM AMMO WOOD BOX ENGINEERING TEST	EVT 04-90
105MM HOWITZER AMMO ADAPTER ASSEMBLIES	DEV 13-87
105MM HOWITZER CARTRIDGES/HORIZONTAL ENGINEERING TEST	EVT 10-89
105MM HOWITZER PLASTIC CONTAINER	EVT 09-89
105MM TANK AMMO IN PA 104 CONTAINERS UNITIZATION TEST	EVT 03-85
120MM BATTALION MORTAR SYSTEM (BMS) MORTAR AMMO TESTING	EVT 01-87
120MM MORTAR LOOSE PROJECTILE RESTRAINT SYSTEM (LPRS) FAT	91-07
120MM MORTAR MIL-STD-1660 TESTS	91-18
120MM TANK AMMO ON STD PALLET SAFETY STRAP EVALUATION	EVT 27-88
120MM TANK AMMO TOPFRAME LIFTING EYE/FORKTINE PROJ	EVT 12-89
120MM TANK AMMO TRAINING ROUND	DEV 10-87
152MM CARTRIDGE DEMIL	EVT 05-83
152MM FUZE REMOVAL FUNCTION TEST	EVT 21-82
155MM BINARY CHEMICAL PROJECTILE M687 PALLETIZED	EVT 33-88
155MM FIRST ARTICLE TEST	EVT 04-88
155MM METAL FIELD ARTILLERY PROJECTILE PALLET RAIL IMPACT	EVT 18-90
155MM PALLET STABILITY TEST	EVT 09-88
155MM PLASTIC PROP CHARGE CNTR LONG-TERM OUTDOOR STORAGE OF	EVT 26-88
155MM PROP CHARGE CNT W/INTER DUNNAGE MIL-STD-1660	EVT 40-87
155MM PROP CHARGE CONTAINERS PLASTIC MIL-STD-1660 TEST	EVT 41-87
155MM READY RACK (FAPC-NOW 155MM PROJECTILE COMPOSITE PAL)	DEV 06-84
2,000-POUND BOMBS IN SIDE-OPENING COMMERCIAL CONTAINER TEST	EVT 22-90
21C FIBER DRUM RAIL IMPACT TEST	91-19
21C FIBER DRUMS, TRANSPORTABILITY TEST	EVT 17-87
25MM CARTRIDGE UNITIZATION TEST	EVT 04-86
30MM AMMUNITION IN CNU-332/E IN 48-FOOT VAN TRAILER	EVT 16-90
30MM BREAKDOWN TEST	EVT 04-85
5-TON DROPSIDE TRUCK TRANSPORTABILITY TEST	EVT 21-87
6,000 GALLON WATER DISTRIBUTOR RAIL IMPACT TEST	EVT 05-90
8-INCH LOOSE PROJECTILE RESTRAINT SYSTEM (LPRS) RESTRAINT NET	92-01
90MM SIMULATED FILLED PROJECTILES UNITIZATION TEST	EVT 32-87
ADP FOR AV	DEV 06-82
ADP FOR DEN EQUIPMENT	DEV 07-82
AEROQUIP CORP SAFETY BAR	EVT 24-87
AIR FLEX AMMO SHELTERS	DEV 06-83
ALLVAN TAUTLINE TRAILER	EVT 27-87
ALUMINUM PREFABRICATED REUSABLE DUNNAGE	EVT 08-89

AMMO LOADED TACTICAL VEHICLES RAPID DEPLOYMENT TEST	EVT 34-89
AMMUNITION CERTIFICATION OF USMC M927A1 TRUCK AND M923A1 TRUCK	92-10
AMMUNITION CONTAINERS (AMCON) TRANSPORTABILITY TESTING	EVT 27-90
ANALYSIS OF COMMERCIAL PRODUCTS	DEV 17-81
ANCRA INTERNATIONAL RIGID RESTRAINT BEAM EVALUATION	EVT 17-90
APE 1028 E004 AUTOMATIC PROPELLANT DRAW-OFF FUNCTION TEST	EVT 17-82
APE 1072 CLOSED CIRCUIT TCV SYSTEM	DEV 05-82
APE 1148 OPERATIONAL TEST	EVT 09-90
APE 1962E006 KIT CONTINUITY TEST OF PRIMER MK42	EVT 07-84
APE 1974 E002 ENGINEERING TEST	EVT 33-89
APE 2001 20MM BREAKDOWN MACHINE FUNCTION TEST	EVT 15-82
APE 2011 FUNCTION TEST	EVT 03-83
APE 2028 .50 CAL DECORING MACHINE FUNCTION TEST	EVT 16-82
APE 2040 IGNITION CARTRIDGE REMOVAL OPERATIONAL SHIELD	EVT 23-82
APE 2061 ASSEMBLY/DISASSEMBLY M605 FUZE FUNCTION TEST	EVT 14-82
APE 2199 ELECTRICAL SUPPORT	DEV 08-83
APE 2206 ROCKET MOTOR DISASSEMBLY OPERATIONAL TEST	EVT 11-90
APE 2245 MOTOR DISASSEMBLY/ASSEMBLY MIL-STD-398	EVT 10-90
APE 7025 DEEP CAVITY DRILL CANCELLED NOW EVT 14-83	DEV 12-83
APE 7033 20MM DISASSEMBLY MACHINE ENGINEERING TEST	EVT 16-88
ARC ACCIDENT RESISTANT CONTAINER CANCELLED EVT 9-83	EVT 04-84
ARC WADS HARC CONTAINER TRANSPORTABILITY TEST	EVT 09-83
ARMOR TILE UNITIZATION PROCEDURE MIL-STD-1660 TEST	EVT 48-87
ARRCOM PLANT CONTAINERIZATION FACILITY DESIGN/EVALUATION	DEV 07-81
ATCMS PODS TRANSPORTABILITY TEST	EVT 37-88
ATLD CRANE 14-TON RAIL IMPACT TEST	EVT 29-89
AUTOMATED RETRIEVAL SYSTEM FOR SOPs	DEV 11-81
BASIC UPLOAD-TRANSITION TO WAR (3-WHEELED CART)	DEV 02-82
BATTALION MORTAR SYSTEM, 120MM MORTAR AMMO TESTING	EVT 15-87
BIG FOOT TIEDOWN FITTING QUALIFICATION TESTING	EVT 29-90
BINARY M687	DEV 09-83
BINARY PROJECTILE M687 - TACTICAL TIEDOWN TEST	EVT 19-84
BLOCKING METHOD FOR 21C DRUMS, RADFORD APP	EVT 18-88
BLUE RIBBON PANEL CANCELLED (NOW DEV 14-85)	DEV 04-81
BOXCAR TRANS ENGR TEST PLASTIC PROP CHARGE CNTR ON METAL PAL	EVT 13-89
BULK EXPLOSIVES LOADED IN A TRAILER TRANS TEST	EVT 12-82
BULK EXPLOSIVES PACKAGING CANCELLED	DEV 13-86
BURNING TRAYS	DEV 14-84
CARGO TIEDOWN WEB STRAP VS. SAFETY TIEDOWN STRAP FOR MLRS CNTAINR	91-22
CBU-89/B RAIL IMPACT TEST	EVT 09-85
CHAMFERS	EVT 07-86



CHEMICAL LAB RELOCATION	DEV 10-83
CLEAN BURNING DIESEL FORKLIFT	DEV 21-81
CLIPLESS SEALS/CLIPPED SEALS SUGGESTION EVALUATION	EVT 29-88
CNU 355 AND 305E RAIL IMPACT TEST CANCELLED	EVT 12-86
COMBAT TELESCOPED AMMO SUPPLY (CTASS) EVALUATION	DEV 05-90
COMMERCIAL CONTAINER IMPROVED DUNNAGE METHOD	91-12
COMMERCIAL UTILITY CARGO VEHICLE (CUCV)	EVT 05-86
CONTAINER GEMMS MINE UNITIZATION	EVT 41-88
CONTAINER MARINE CORPS TOP OPENING	EVT 08-84
CONTAINER PALLET ADAPTER 25MM	DEV 16-86
CONTAINER ROCKET 4-ROUND 2.75"	DEV 11-88
CONTAINERIZATION TRAINING VIDEOTAPE	92-15
CONTAINERS, PA 37 AND EXTERNAL BUNDLING STRAP UNITIZ TEST	EVT 16-87
COPPERHEAD PALLET	EVT 11-85
CUBIC PRECISION SURVEY OPTICAL RANGE FINDER	EVT 32-88
DE OFFICE AUTOMATION	DEV 03-81
DECISION MODEL PALLETIZATION	DEV 08-81
DEEP CAVITY DRILL APE 7025	DEV 14-83
DEHUMIDIFICATION EARTHCOVERED MAG CANCELLED(DEV 06-85)	DEV 17-84
DEHUMIDIFICATION SYSTEM FOR EARTHCOVERED MAGAZINES	DEV 06-85
DEMIL ALTERNATIVE STUDY	DEV 12-88
DEMIL CONCEPT FOR CBU-75	DEV 16-83
DEMO GROUND FACILITIES	DEV 21-84
DEMO OF DREXEL CLEAN BURNING DIESEL 4K SIDESWING FORKLIFT	EVT 28-88
DEPOT AREA AIR MONITORING SYSTEM (DAAMS)	DEV 02-83
DEPOT MOD	DEV 13-77
DEPOT MOD (REVISED)	DEV 01-86
DEPOT MOD SHIPPING/RECEIVING FACILITY	DEV 06-87
DESCOM OUTLOADING CAPABILITY REVIEW	DEV 12-81
DMWR PREPARATION AND EVALUATION	DEV 10-81
DOT 21C FIBER (EMPTY PROP DRUMS) AND EMPTY FIBER BOXES TNT	EVT 37-87
DRAGONWAGON	EVT 19-82
DROPSIDE M871/M872 MODIFICATION	EVT 03-86
DS2 CONTAINER PERFORMANCE ORIENTED PACKAGING (POP) TEST	92-08
DS2 CONTAINERS UNITIZATION/STACKING TEST	EVT 13-90
DSWS PREPARATION OF LOAs and ROC	DEV 15-81
DURANDAL CONTAINERS AIR FORCE CNU-381/E	EVT 17-88
EMERGENCY RESPONSE PROCEDURES FOR DOD VEHICLE ACCIDENTS	DEV 08-87
ENHANCED SELF-PROPELLED ARTILLERY WEAPON SYSTEM (ESPAWS)	DEV 01-81
EUROPEAN MAINTENANCE FACILITY	DEV 23-84
EUROPEAN TRIP - ASSISTANCE VISIT	DEV 08-86

FAASV FOR AMMO/MISSILE RESUPPLY EVALUATIONS	DEV 01-90
FACILITY ENGINEERING SUPPORT	DEV 04-82
FAMILY OF MEDIUM TACTICAL VEHICLES (FMTV) TRANSPORTABILITY TESTIN	92-11
FAPC	DEV 07-84
FIBER DRUM CA-190/1-81) TEST	EVT 04-89
FLATRACK	EVT 22-82
FLUIDIZED BED INCINERATOR (FBI)	DEV 03-83
FORKLIFT 4,000 LB ELECTRIC PNEUMATIC TIRED	DEV 11-78
FORKLIFT 4,000-2,500 LB FRONT SIDE LOADING	DEV 02-81
FORKLIFT SHOOTING BOOM EVALUATION	DEV 11-83
FORKLIFT TRANSPORT TRAILERS (CROSS REF: DEV 05-81)	DEV 04-84
FORKLIFT TRANSPORT TRAILERS FOR EUROPE (CROSS REF: DEV 4-84)	DEV 05-81
FOUR-LEGGED SLING	DEV 12-86
GENERIC AMMO LOADING SYSTEM (GALS)	DEV 12-85
GIANT SLIP SHEET PROJECT	EVT 02-83
H1572 KIT FOR 155MM PROJECTILES (M753 SYSTEM)	EVT 35-90
HALF-HIGH INTERMODAL SHIPPING CONTAINER TRANS TEST	EVT 27-89
HANDLING DEVICE H1571 AND H1572 KIT	EVT 30-89
HAZARDOUS WASTES FROM AMMO OPERATIONS	DEV 15-84
HELFAST	DEV 24-78
HEMAT (WAGON VERSION)	EVT 39-88
HEMAT HEAVY EXPANDED MOBILITY AMMO TRAILER	EVT 01-86
HEMAT HEAVY EXPANDED MOBILITY AMMO TRAILER TRANSPORT RETEST	EVT 07-90
HEMAT HEAVY EXPANDED MOBILITY AMMO TRUCK	EVT 35-88
HEMTT AND GERMAN M.A.N. VEHICLE EVALUATION	DEV 18-81
HEMTT CHAIN SLING FOR	DEV 07-87
HEMTT DEMO OF LOADING 120MM PALLETS ON	EVT 24-89
HEMTT FLOATING DUNNAGE RESTRAINT FOR 155MM PROJECTILES	EVT 08-88
HEMTT TEST (SIDEWALL)	EVT 14-85
HEMTT TEST OF TWO-HIGH PALLETIZED USING WEB STRAP TIE TRANS	EVT 37-89
HEMTT TRANS TEST PATRIOT	EVT 08-82
HEMTT UBL 8-IN TRANSPORTABILITY TEST	EVT 20-87
HEMTT/HEMAT	EVT 09-82
HEMTT/HEMAT QUICKLOAD TIEDOWN PROCEDURES	EVT 13-86
HMMWV AIR CERTIFICATION FOR MOVEMENT OF AMMO	EVT 09-87
HMMWV HIGH MOBILITY MULTIPURPOSE WHEELED VEHICLE	EVT 15-83
HMMWV IMPROVED TIEDOWN FITTINGS	EVT 31-88
HMMWV TIEDOWN FITTINGS	DEV 01-88
HMMWV VARIANT 9,400-LB. M1069	EVT 33-87
HOLD DOWN RING	EVT 13-87
HOME COMPANY TRAILER W/TWIST LOCK DEVICES - TRANS TEST	EVT 08-83

HOWITZER M119	EVT 02-86
ICE CONTAINER FLOOR LOADING TEST	EVT 20-88
IGLOO DOOR ALTERATIONS	DEV 05-85
IGLOO DOOR ALTERATIONS CANCELLED (NOW DEV 05-85)	DEV 20-84
IGLOO MUNITIONS HANDLING SYSTEM (IMHS) DEMONSTRATION 1989	DEV 03-89
IMPROVED UPLOADING SYSTEM	EVT 06-85
INDUSTRIAL ROBOT APPLICATIONS IN AMMO ENVIRONMENTS	DEV 14-87
INERT STORAGE FACILITIES CANCELLED	DEV 18-84
INSTALLATION, RECEIVING AND OUTLOADING CAPABILITIES	DEV 06-89
INTEGRATED MOD SYSTEM	DEV 18-83
INTRA-INSTALLATION TRANSPORT OF MUNITIONS	DEV 03-84
INVESTIGATION OF IMPROVED TRANSPORTABILITY TEST METHODS	DEV 03-88
KOREAN AMMUNITION SEMINAR	DEV 01-83
LADING STRAP ANCHORS IN BOXCAR 1-1/4 INCH	EVT 31-89
LANCE ON FLATRACK - RAIL IMPACT	EVT 02-88
LEAD CARE AND PRESERVATION FACILITY	DEV 12-87
LIGHT ARMORED VEHICLE (LAV)	EVT 01-88
LIMITED MOVEMENT PROCEDURES FOR NUCLEAR WEAPONS	EVT 22-87
LIPGRIP METAL CONTAINER INTERLOCKING TEST	EVT 06-86
LOAD AND ROLL PALLET PROCUREMENT SPECIFICATIONS	DEV 03-90
LOAD BINDER SECURITY DEVICE EVALUATION	EVT 07-88
LOAD COMPARISON TOFC VS COFC	EVT 36-88
LOOSE LAND MINE RESTRAINT SYSTEM	DEV 04-89
LOOSE PROJECTILE RESTRAINT SYSTEM (LPRS) 120MM MORTAR	DEV 04-87
LOOSE PROJECTILE RESTRAINT SYSTEM (LPRS) 155MM	DEV 08-84
LOOSE PROJECTILE RESTRAINT SYSTEM (LPRS) 8"	DEV 11-86
LPRS PANEL, TRANSPORTATION SIMULATION OF	EVT 25-87
LTL FACILITIES CANCELLED	DEV 19-84
M1 LIFTING BEAM FILE NOW LOCATED IN DEN	DEV 02-86
M118 TRUCK WITH ELECT POWER UNIT II FOR PATRIOT SYSTEM	EVT 02-84
M119A2 SQUARE RIM CONTAINER PALLET	DEV 07-88
M127 STATIC PULL TEST	EVT 18-87
M127, 12-TON SEMITRAILER TIEDOWN ANCHORS	EVT 06-87
M149A2 WATER TANK TRAILER RAIL IMPACT	EVT 07-89
M16A1 MINE RENOVATION EQUIPMENT OPERATIONAL TEST	EVT 08-90
M200A1 2-1/2 TON TRAILER CHASSIS TRANS TEST	EVT 18-89
M203A1 PROP CHARGE CONTAINER UNITIZATION TEST	EVT 32-89
M203A1 SQUARE RIM CONTAINER PALLET	DEV 08-88
M2A1 ADAPTER	EVT 05-88
M2A1 CANS UNITIZATION TESTING	EVT 10-86
M2A1 CONTAINER PALLET ADAPTER	DEV 17-86

M2A1 CONTAINERS MIL-STD-1660 CA 185/56-81 PROJECT	EVT 11-87
M2A1 CONTAINERS MIL-STD-1660 WR53/806	EVT 12-87
M2A1 METAL CONTAINERS NAVY PROCEDURES FOR UNITIZATION	EVT 14-81
M2A1 PLASTIC UNITIZATION MIL-STD-1660 TEST	EVT 29-87
M373A2 6-TON ELECTRIC VAN SEMI-TRAILER TRANS TEST	EVT 26-89
M3A1 SQUARE RIM CONTAINER PALLET	DEV 05-88
M422 PROJECTILE SYSTEM TRANS TEST	EVT 14-86
M422 TIEDOWN TEST	EVT 13-82
M454, M422, AND M753 TIEDOWN PROCEDURES TRANS TEST	EVT 23-87
M467 AND M613 CONTAINERS ON HMMWV TRANS TEST	EVT 25-89
M4A2 SQUARE RIM CONTAINER PALLET	DEV 06-88
M55 ROCKET ASSESSMENT STUDY	DEV 22-84
M621 25MM PLASTIC CNTR. PERFORMANCE ORIENTED PACKAGING (POP) TEST	92-06
M727 FUZE ROAD TRANSPORTABILITY TEST	EVT 10-83
M796 BOLSTER TRAILER TRANSPORTABILITY TEST	EVT 11-82
M82 PRIMER; DRAWING NO. E-11674 PROPOSED BARRICADE TEST	EVT 24-90
M871 DROP-SIDE TRAILER	EVT 20-89
M871/M872 TIEDOWN FITTINGS EVALUATION	EVT 06-90
M871A2 SEMITRAILER TRANS TEST	EVT 19-89
M872A3 TRAILER 34-TON SEMITRAILER	EVT 03-84
M923A2 5-TON CARGO TRUCK AMMO LOAD CERTIFICATION	EVT 34-88
M927-928 5-TON TRUCK AMMO LOAD CERTIFICATION	EVT 34-87
M970A1 5000-GAL MILITARY FUEL TANKER RAIL IMPACT	EVT 23-88
M973E1 CARGO & XM1067 FLATBED SUSV TRANS TEST	EVT 16-89
MAINTENANCE BLDG JI	DEV 03-85
MANPADS (HMMWV)	DEV 02-87
MANPADS PROPOSALS TESTING AND EVALUATION	EVT 01-89
MATERIEL EVALUATION PROGRAM	DEV 09-85
MAVERICK, AIR FORCE FLATRACK	EVT 13-85
MAVRICK MISSILE IN CNU/399E/425/E FIBERGLASS TRANS TEST	EVT 17-89
MCA PROJECTS (Includes Trans Test Facility)	DEV 07-83
METAL STRAPPING CLIPLESS SEALERS EVALUATION	EVT 44-87
METEROLOGICAL REG 200-XXXX	DEV 14-85
MHE FOR CASTOR IV MOTORS	DEV 19-81
MHE FOR PERSHING II MISSILE	DEV 14-81
MICRO CIRCUIT TECHNOLOGY EVALUATION	DEV 04-86
MIL-STD-1660 TEST USING STANAG 2828 VERSUS MIL-P-15011	91-23
MIL-STD-1660 TEST, PA97 SERIES CONTAINERS W/ADDITIONAL SHORT LAYER	91-08
MIL-STD-1660 TESTS OF 2.75-INCH ROCKET METAL PALLETS W/ADAPTERS	91-17
MIL-STD-1660 TESTS OF 40MM AMMUNITION ON METAL PALLET W/ADAPTERS	92-07
MIL-STD-1660 TESTS OF ALTERNATE DESIGN 40MM PALLET	92-09

MIL-STD-1660 TESTS OF CARISTRAP	92-14
MIL-STD-1660 TESTS OF COLLAPSIBLE ALUMINUM PALLET SYSTEM	92-17
MIL-STD-1660 TESTS OF PLASTIC PALLET	92-13
MIL-STD-1660 TESTS OF REPLACEMENT MATERIALS FOR THE OAK PALLET	92-05
MIL-STD-1660 TESTS ON 4.2-INCH SPECIAL USE PALLET (SUGGEST. EVAL)	91-15
MIL-STD-1660 TESTS ON WOODEN BOX PALLET	91-14
MIL-STD-398 OPERATIONAL SHIELD TEST FOR NET WEIGHT FILLING SYSTEM	91-13
MIL-STD-398 TEST OF MANUAL EXPLOSIVES TRANSPORT VEHICLE (METV)	91-04
MIL-STD-398 TESTING OF EXPLOSIVE CONTAINMENT DEVICE (ECD)	91-16
MILVAN FIRST ARTICLE TEST RAIL IMPACT TEST	EVT 19-90
MILVAN STATIC DISCHARGE TEST	EVT 17-84
MILVAN STATIC DISCHARGE TEST CANCELLED (EVT 17-84)	DEV 11-84
MILVAN W/WOODEN AND RUBBERIZED FLOORING EVALUATION	EVT 22-88
MIN DUNNAGE MTD. F/RESTRAINT OF 120MM PALLETS IN 20-FT. COM CNTRS	92-04
MIN. DUNNAGE MTD. FOR RESTRAINT OF 120MM PALLETS IN 20-FT MILVANS	92-03
MINES NAVY MK40 DST, MK41DST AND M55 ROAD TEST	EVT 24-88
MK-82 (500-LB) BOMBS ON MHU-149/E METAL PALLETS	EVT 34-90
MLRS CONTAINER SAFETY TIEDOWN STRAP EVALUATION	EVT 43-87
MLRS POD STABILIZER	DEV 02-89
MLRS PODS ON CENTER BEAM BULKHEAD FLATCAR RAIL IMPACT TEST	91-06
MLRS PODS TRANSPORTABILITY TEST	EVT 08-86
MLRS RAIL IMPACT TEST	EVT 20-82
MODULAR PACK MOVE SYSTEM (MOPMS) PALLET	DEV 09-87
NAVY MINES TRANSPORTABILITY TEST	EVT 30-88
NRDEC MILVAN SOLAR RADIATION TEST	92-12
NUCLEAR WEAPONS IN TACT VEH SPECIAL TIEDOWN PROCEDURES	EVT 01-83
NUCLEAR WEB STRAP STUDY	DEV 05-87
OFF-POST DEMIL	DEV 03-82
OPERATION DESERT SHIELD	EVT 33-90
OUTLOADING PROCEDURE 19-48-7115 TRANSPORTABILITY TEST	EVT 23-90
PA104 PACKED AS 19-49-4079 SLINGING DAMAGE DETERMINATION	EVT 06-89
PA116 LIPLESS GRIPPED CONTAINERS MIL-STD-1660 TEST	EVT 02-89
PA117 CONTAINERS ON METAL PALLETS W/ADAPTERS MIL-STD-1660	EVT 25-90
PA117 WOOD UNITIZATION MIL-STD-1660 TEST	EVT 03-89
PACKAGING, HANDLING, & TRANSPORTABILITY REVIEW OF EUROPE	DEV 06-81
PALLA GARD TRANSPORTABILITY TEST	EVT 04-87
PALLET -1660 TEST OF VOLCANO WOOD PALLET	EVT 13-88
PALLET 105MM AND 4.2-IN CHEMICAL PROJ MIL-STD-1660 TEST	EVT 35-87
PALLET 105MM TANK AMMO	DEV 02-85
PALLET 120MM REDESIGN OF TOP-LIFTING FRAME	DEV 01-89
PALLET 120MM TANK AMMO	EVT 09-86

PALLET 1660 TEST OF REVISED METAL/PALLET WITH TOP ADAPTER	EVT 15-90
PALLET 2.75 IN ROCKET STEEL DRUM MIL-STD-1660	EVT 36-87
PALLET 2.75 INCH ROCKET METAL PALLET AND ADAPTERS	EVT 32-90
PALLET 2.75-IN ROCKET METAL	DEV 11-85
PALLET 25MM CONTAINER TESTING	EVT 28-90
PALLET 40MM METAL WITH TOP LIFT	EVT 11-88
PALLET 81MM MORTAR PALLET TEST (BRITISH MANUFACTURER)	91-01
PALLET 81MM PLASTIC MORTAR CONTAINER	DEV 09-86
PALLET ADAPTER 40MM CONTAINER	DEV 15-86
PALLET ADAPTER PLASTIC METAL PROP CHARGE CONTAINER	DEV 18-86
PALLET ADAPTER TACTICAL EXPLOSIVES SYSTEM (TEXS)	DEV 14-86
PALLET ALTERNATIVE FOR PA104 METAL CONTAINER	DEV 03-86
PALLET ALUMINUM 2,200 LB MO INDUSTRIES	EVT 14-88
PALLET FAST CERTIFICATION FOR MLRS AND ATACMS	EVT 12-90
PALLET FIBER COMPOSITE EVALUATION	EVT 14-84
PALLET GDC VECR REDUCTION OF WOOD DUNNAGE/120MM TANK AMMO	EVT 11-89
PALLET GE PLASTIC MIL-STD-1660 TEST	EVT 46-87
PALLET GENERAL DEFENSE METAL MIL-STD-1660 ACCEPTANCE	EVT 19-88
PALLET HELGESON MODIFIED STD METAL MIL-STD-1660 TEST	EVT 47-87
PALLET HOWITZER METAL CONTAINER	DEV 02-90
PALLET LAMINATED WOOD (CROSS REF EVT 07-80)	EVT 09-84
PALLET LAMINATED WOOD (CROSS REF EVT 7-75)	EVT 38-88
PALLET METAL PA117 AMMO CAN ON STD W/PAL ADAPTER	EVT 02-87
PALLET METAL STANDARD PA116 EVALUATION	EVT 12-88
PALLET MO INDUSTRIES ALUMINUM 3,300 LB MIL-STD-1660	EVT 15-88
PALLET MODIFIED HARDWOOD MIL-STD-1660	EVT 01-90
PALLET PA116 120MM WOOD MIL-STD-1660	EVT 49-87
PALLET PA116 WOOD PALLET WITH TOP LIFT 6 HIGH MIL-STD-1660	EVT 22-89
PALLET PA116 WOOD WITH TOP LIFT 4 HIGH MIL-STD-1660	EVT 21-89
PALLET PA116, 120MM CONTR ON WOOD PALLET MIL-STD-1660	EVT 21-88
PALLET PALLET ADAPTERS VOLCANO METAL MIL-STD-1660 TEST	EVT 02-90
PALLET PLASTIC ARENA ASSOCIATES MIL-STD-1660	EVT 07-87
PALLET PLASTIC, FUNCTIONAL PALLET SYSTEMS, INC	EVT 08-87
PALLET PLASTIC/METAL STUDY	DEV 04-85
PALLET PROJECTILE COMPOSITE (FAPC) REPLACES READYRACK	DEV 08-85
PALLET STANDARD METAL MIL-STD-1660 ACCEPTANCE	EVT 38-87
PALLET STD METAL 53 X 42 MIL-STD-1660	EVT 28-89
PALLET TEST 120MM PROJECTILE MORTAR PALLET	DEV 06-86
PALLET TEST BIG LEAF MAPLE	EVT 30-87
PALLET TEST PA106 (155MM PROP CHARGE CONTAINER)	EVT 18-85
PALLET TEST PA107 (155MM PROP CHARGE CONTAINER)	EVT 19-85

PALLET TOP LIFTING DEVICE 120MM PA116 MIL-STD-1660	EVT 39-87
PALLET TOP LIFTING DEVICE PA116 120MM WOOD MIL-STD-1660	EVT 50-87
PALLET TOPS MODIFIED FOR SEP LOAD PROJECTILES	EVT 06-84
PALLET UNITIZED MINIMUM CHAIN SLING LIFTING ANGLE	EVT 42-87
PALLET VOLCANO METAL MIL-STD-1660	EVT 31-87
PALLET VOLCANO REVISED METAL AND TOP ADAPTER MIL-STD-1660	EVT 15-90
PALLET VOLCANO XM 87/88	DEV 07-86
PALLET W/METAL TOP LIFT PA116 155MM METAL CANS ON WOOD	EVT 10-88
PALLET W/PALLET ADAPTER PA116 AMMO CANS ON STD METAL	EVT 03-87
PALLET WOOD VOLCANO MIL-STD-1660 TEST	EVT 51-87
PALLET, 105MM PALLET FIRST ARTICLE TESTING (FAT)	91-11
PALLET, 40MM PA120 CONTAINER PALLET RAIL IMPACT TEST	91-10
PALLET, L.T. HEMPLE PLASTIC-STEEL REINFORCED MIL-STD-1660	EVT 52-87
PALLETIZATION OF 20MM CARTRIDGE 250 ROUND BULK PACK	EVT 06-83
PALLETIZATION OF FIBERBOARD BOXES FOR M549 PROPELLANT GRAIN	EVT 13-83
PALLETIZATION OF SQUARE END CONTAINER F/M203 STICK PROP CHG	EVT 07-83
PALLETIZATION TEST OF BULK EXPLOSIVES	EVT 04-83
PALLETIZATION TEST OF DEMO CHARGES IN M2A1 CONTAINER	EVT 15-84
PALLETIZED LOADING SYSTEM (PLS)	91-02
PALLETIZED LOADING SYSTEM (PLS) STUDIES	DEV 04-90
PASSIVE AMMUNITION	DEV 06-90
PASSIVE AMMUNITION STORAGE SYSTEM (PASS) STUDY	91-03
PATRIOT ON HEMTT TRANS TEST	EVT 19-87
PATRIOT PU-789/M RAIL IMPACT TEST	EVT 03-88
PERSHING II	EVT 10-82
PERSHING II IMPROVED MOBILIZER	DEV 13-85
PERSONNEL SHIELD AT LONESTAR AAP MIL-STD-1660 TEST	EVT 03-90
PLASTIC DRUM 55-GALLON	EVT 45-87
PLS PALLETIZED LOADING SYSTEM	EVT 12-85
PM-AMMOLOG PROJECT INITIATIVES	DEV 05-84
POLLUTION ABATEMENT PROJECT BURNING TRAYS	DEV 12-84
POWER DRIVEN NAILS ENGINEERING TEST	EVT 15-89
PRESSURE TEST OF CONTAINERS	EVT 08-85
PROJECTILE STACKER DESTACKER	DEV 07-85
PROP CHARGE CONTAINER 155MM	EVT 15-85
PULL TEST OF MIAD STEEL STRAP HOLDERS AND SNAP HOOKS	EVT 36-89
QUALIFICATION TESTING OF THE "MICKEY MOUSE" TIEDOWN FITTING	91-21
QUALIFICATION TESTING OF LIQUID PROPELLANT	91-05
QUICK RESPONSE TEST OF DELUGE SYSTEM USED W APE 2170	EVT 11-84
RATCHET TYPE LOAD BINDER (ANALYSIS OF)	EVT 31-90
REMOTELY PILOTED VEHICLE (RPV)	EVT 26-87



REORGANIZATION OF PACKAGING DEVELOPMENT	DEV 15-83
ROBOTIC APPLICATIONS HANDBOOK FOR EXPLOSIVE ENVIRONMENTS	DEV 03-87
ROCKET DRUM PACK	EVT 15-79
ROLAND FIRE UNIT MODULE	EVT 01-84
ROTARY TOWED SWEEPER RAIL IMPACT TEST	EVT 14-90
ROUGH TERRAIN FORKLIFT	DEV 09-82
RUST INFORMATION STUDY	EVT 10-84
SECONDARY STEEL CONTAINER	DEV 05-89
SECUREMENT OF 155MM BINARY PROJECTILES W/STRAPPING	EVT 23-89
SECURITY OF 1-TON CHEMICAL CONTAINER	DEV 03-76
SELF-CONTAINED STORAGE & MATERIAL HANDLING SYSTEM CANCELLED	DEV 01-87
SENSOR PROBE FOR TCM FILTER	DEV 20-81
SGT YORK 40MM AMMUNITION CONTAINER	EVT 12-83
SHAKE RATTLE ROLL TEST OF M55 CHEMICAL ROCKET	EVT 02-85
SHIPBOARD TRANSPORTATION SIMULATOR (STS)	EVT 18-84
SHIPBOARD TRANSPORTATION SIMULATOR TEST OF CONVENTIONAL AMMO	EVT 21-90
SHOALS AMER IND M871 SEMITRAILER TRANS TEST	EVT 05-87
SHOP VAN TRAILER	EVT 10-87
SIDE LOADING INTERMODAL CONTAINERS	DEV 02-84
SINGLE ROUND CONTAINERS (SRC) FOR M55 ROCKET	DEV 24-84
SINGLE ROUND CONTAINERS FOR PROJECTILES	DEV 10-85
SIX-LEGGED SLING AND BEAMS	DEV 09-84
SLP UNITS STORAGE AND OUTLOADING COMPARISONS	DEV 01-82
SMOKE AND CS FUNCTION TEST EQUIPMENT	EVT 18-82
SOP FOR DEN FUNCTION TEST EQUIPMENT	DEV 08-82
SOP FOR TEST OF COMMERCIAL X-RAY EQUIPMENT	DEV 11-87
SOP MANAGEMENT SYSTEM	DEV 01-84
SPECIAL WEAPONS STORAGE CONCEPT	DEV 04-83
SPEMS AIRCRAFT MAINTENANCE PLATFORM	EVT 13-84
SQUAD AUTOMATIC WEAPON	DEV 15-87
SRC ON M55 MIL-STD-1660	EVT 38-89
STANAG - 2925	DEV 10-80
STANAG - STANDARDIZATION AGREEMENT	DEV 07-78
STORAGE FACILITIES IN SUPPORT OF USADACS	DEV 16-81
STRADDLE LIFT TRAILER REPLACEMENT/REDESIGN	DEV 19-83
STRAPPING 3/4"	EVT 15-86
STRAPPING 3/4-IN REEVALUATION (FORMER EVT 15-86)	EVT 06-88
STRETCH NET FOR SECURING UNIT LOADS OF BOXED AMMO	EVT 16-84
SUPPORT TO HIGH TECHNOLOGY TEST BED	DEV 13-83
SURVEILLANCE MOD	DEV 05-83
SURVIVABILITY OVERPACK CONTAINER (SOC)	EVT 11-86

SUSV - SMALL UNIT SUPPORT VEHICLE	EVT 12-84
SYNTHETIC BANDING MATERIALS	EVT 14-87
SYVA EQUIPMENT (DRUG)	DEV 10-86
TACTICAL EXPLOSIVE SYSTEM (TEXS) MIL-STD-1660 TEST	EVT 26-90
TACTICAL EXPLOSIVE SYSTEM (TEXS) RAIL IMPACT TEST	EVT 25-88
TACTICAL VEHICLES (WEB STRAP TIEDOWNS) RAIL IMPACT TEST	EVT 20-90
TANK AMMO PALLET 120MM	DEV 10-84
TCM MONITORING & PERSONNEL PROTECTION CLOTHING STUDY	DEV 09-81
TECH ASSISTANCE INV TCM	DEV 27-78
TECHNICAL SUPPORT FOR WORD PROCESSING	DEV 17-83
TEMPERATURE HUMIDITY (AIR FORCE MILVAN)	EVT 16-85
TEMPERATURE HUMIDITY (MARINE CORPS SHIPS)	EVT 17-85
TEMPERATURE HUMIDITY ABOARD SHIPS 7-85-1 AND 7-85-2 REPORTS	EVT 07-85
TERMITE INFESTATION - JI	DEV 01-85
THERMO COATED BOMBS PROCESSING	DEV 16-84
TOP-LIFTING DEVICE (cross with DEV 3-86)	EVT 28-87
TRACER REMOVAL MACHINE	EVT 11-83
TRANS TESTS OF ISO CONTAINER SECURED W/CHAINS AND LOAD BINDERS	92-16
TRANS. TESTING OF MLRS PODS OR ATACMS/SIDE-OPENING COM. CONTAINER	92-02
TRANSPORTABILITY TEST FACILITY	DEV 09-88
TRANSPORTABILITY TEST FOR NAVY	EVT 01-85
TRANSPORTABILITY TEST OF CNU-180 B/E CONTAINERS	EVT 35-89
TRANSPORTABLE SHELTER DOLLY SET RAIL IMPACT TEST	EVT 43-88
TYGARD RESTRAINT SYSTEM	EVT 40-88
U.S. NAVY (USN) ALPHA MINE ROAD TEST	91-20
UNDERGROUND STORAGE (REVISITED)	DEV 02-88
UNIT LOAD AVIATION RESUPPLY PALLET (ULARP)	91-09
UNIVERSAL LEAKER CONTAINER FOR TOXIC CHEMICALS	DEV 13-81
UNIVERSAL TCM LEAKER CONTAINER - CANCELLED	DEV 13-84
VAN TRAILERS USING FLOORLINE BLOCKING RAIL IMPACT TEST	EVT 42-88
WADS WEAPON ACCESS DENIAL SYSTEM CANCELLED	EVT 05-84
WEAPON SECURITY CONTAINER (WSC) MINIMUM ESSENTIAL TIEDOWN	EVT 14-89
WEB STRAP STUDY	DEV 05-86
WEB STRAP TENSION TEST	EVT 10-85
WESTERN AREA DEMILFACILITY (WADF) UNSOLICITED PROPOSALS	DEV 07-89
XM1063 10-TON SEMITRAILER RAIL IMPACT TEST	EVT 05-89
XM785 PROJECTILE PROGRAM	EVT 05-85